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Original Contributions.

REMINISCENCES OF PRACTICE.

By W. D. Tenison, D.D.S., New York. Read at Regular Meeting of Alumni Association of New York College of Dentistry, March 10, 1897.

At the request of your executive committee to read a paper at this meeting, I have put down a few recollections of my past experiences and tribulations during a practice of thirty-five years, which can hardly be called a paper, but which may amuse and interest the younger graduates, showing them what we old dentists with limited means had to contend with in acquiring a knowledge to enable us to practice as compared with the present system of education. As I look back I am glad that I entered a profession I can now feel proud of, and congratulate myself that I have had the pleasure of being associated in work with some of the brightest minds who have added their share in putting our specialty of surgery and medicine where it belongs to-day.

In the early days of dentistry I understand an effort was made by some of our practitioners to get medical colleges to add a chair of operative and mechanical dentistry and allow our men to receive the degree of M.D., and, if necessary, special certificates of qualification as dental practitioners, but it was refused, and the outcome was the applications to legislatures for charters for special colleges where our specialty could be taught. In my opinion it ought never to have been so, as we are practicing, I might say, the most important specialty of surgery and medicine that is practiced by any medical men to-day.

To go back to my reminiscences. What made me think of becoming a dentist was this—I was and am related to physicians in many ways, and as my inclinations ran in the same groove, also having a taste for mechanics, I thought of dentistry as a specialty where I saw

great possibilities of doing much good and being afforded a reasonable income. Being acquainted with an old dentist of good standing in New York, I went to him and made my wishes known and he promised to teach me all he could. I think the only college in existence then was the old Baltimore Dental College. As I could not afford to go there I had to content myself with what I could learn in a private way. At that time a dentist was so afraid that another dentist might find out some particular way he had of operating, or some discovery he had made, that all such were kept secret. You can judge then how much a poor young fellow could learn. The only dental literature outside of a dental journal or so was "Harris's Principles of Dental Surgery," which I read faithfully. During my stay with the dentist referred to I was allowed to be present at only one of his operations, the extraction of two upper first molars—I was called in to hold the patient's hands.

I was taught filling by putting teeth in a vise, preparing the cavities, and filling with tin-foil. As to treating diseased teeth, I was *told* how to do it. I was taught how to clean instruments, shape and temper them, after which my education as an operator was pronounced satisfactory and I was competent to practice. I thought so too, and felt very proud, but that conceit was taken out of me later.

The next branch of the profession to learn was artificial work. My preceptor sent me to his artificial worker, who was a good worker but did an advertising business, and consequently turned out a cheap and poor class of work as a rule. As rubber work at that time had not come into general use, he made cheap silver plates for about $10 to $15 each. His mode of getting them up was to cut a pattern, buy a silver plate, which then cost from 50 to 75 cents, swage it up, get plain or gum teeth as the case required, and solder them on with tin, using a roofer's soldering iron. Patients were constantly returning with one or more teeth off. When I asked why he did not solder them so as to be secure, his answer was, "All I want is that they hold on until the patients get out of the office." I said, "They will be back again in a day or so." His reply was, "That is all right; I will then charge for putting the teeth on again." I regret to say we have a class of men to-day who practice on the same principle.

After about six months of such instruction, cleaning up the laboratory, and making one of those silver plates, I was pronounced a

competent mechanical dentist, and with a certificate to that effect from each of the dentists was let loose to prey on the community. As I had had no actual practice, only in a measure theory, and as there was no law or code of ethics to regulate the practice of denistry at that time, I thought the best way to get business was to put an advertisement in some of the papers, offering to do work free for the poor during certain hours. The first victim was a young man who wished a lower bicuspid extracted. I put on the forceps with a feeling of perfect confidence and broke off the crown, then went at it again and again, each time breaking off a little more, and finished by breaking the forceps. By that time the poor fellow was on the verge of collapse, so I was obliged to take him out, give him several drinks and send him home, in a measure happy—but I was not happy, the conceit was taken out of me.

My second case was a young woman who wished an upper first molar extracted. I went at that with more care and less confidence and succeeded in getting it out all right. If any of you are fishermen you have, no doubt, some time or other hooked a fine fish, and after much care, caution and trouble landed it; so you will understand my delight when I saw that tooth in the forceps.

I could tell you dozens of experiences, but will confine myself to a very few. About that time I had occasion to go to Paris, France, expecting to return in a few weeks, but after my arrival there several offers were made by dentists to associate with them, as American dentists were much in demand and I was supposed to be a first-class one. The truth was, I never had filled a tooth in the mouth with gold, and very few with any other material.

The gentleman with whom I thought of associating said one day he would like to see me fill a tooth with gold, and would have a patient at the office the following morning. I slept very little that night, for had I failed it would have been known in a day or two by all the Americans there, especially by the few American dentists in Paris at that time, and all my prospects there would have been blighted. However, I braced myself up next morning and met the patient, a gentleman. There were two crown cavities in the two superior first molars. My prospective associate proposed I should fill one and he the other and then compare notes. I suggested, as he was the older, he should hold the post of honor and fill the first one and I would follow. I watched him very closely.

When finished, he laid down the instrument with an air of great pomposity and asked me to examine the filling and tell him what I thought of it—of course I was a good judge. I then followed, filling the other as he did (hand pressure), and, laying my instrument down with the same air of consequence, asked him to examine.

That settled it. The same day I received a proposition to associate, which I accepted. Some days afterwards I was polishing up a gold case at an open window in our laboratory, which was five stories up, and not being an expert, the wheel caught in one of the clasps and out it went. I will not tell you how I felt at what occurred, but I will tell this much, that I nearly followed the case out of the window, my prospective associate (we had not yet signed papers) being a very large and strong man and present at the time. However, we soon understood each other better and became associated, he leaving me in charge of his practice while he made a visit to Spain, having formerly been court dentist there.

As I have already said, rubber work was just coming into general use as a base, and he, being a progressive man, sent to America for a vulcanizer. At that time they were made very large, holding at least a gallon of water. To be sure it was all right before leaving for Spain, he had it filled one day and put on a stove with a good fire under it. I had never seen one used and went up to the laboratory to enjoy the fun. I got it. When the steam began to rise a leakage took place, so the cover was removed and a lot of whiting smeared over the large rubber packing, and as it still leaked after that, my partner and a Spanish man we had hired got into a very angry dispute over it. Suddenly they both left for the office to look up the printed instructions, leaving me alone with the vulcanizer. I was quite near, watching it, when suddenly there was a loud report and I was knocked or fell over in my fright, something struck the ceiling, coming down with a thud on the floor, the room was full of steam and I thought my time had come. I made my way on my hands and knees in the direction of the door, which I reached in short order. At the time of the explosion I had a new silk hat on my head. I wish you could have seen that hat and myself after the room cleared of steam! Both were white, the result of the rubber packing blowing out, which was all covered with whiting. When my partner returned he hardly recognized me or the room, we were both such wrecks. Shortly after that he left for Spain.

It was then my troubles and tribulations commenced in earnest. The first patient after he left was a lady with several teeth decayed, both upper and lower, to be filled with gold, a very wet mouth and no rubber-dam, as it had not been discovered at that time, and I, not knowing how to keep the saliva away, made things lively for us both. She did not understand English, which was fortunate for her, as I gave vent to my feelings in that language. So it went on for six months during his absence, but it was the making of me, for I got an experience I could not have acquired in years had I been building up a practice of my own, and yet I knew very little and had much to learn. I will mention two cases to show you how little I did know even some time after that.

A few years after going to Paris I met a young lady from New York who was perfect in my eyes, so much so that she became my wife. There was only one defect—her two superior centrals, which were large, had been decayed for some time, both dead, much discolored and one of them with a fistulous opening above it. She was so nervous that it was with the greatest difficulty I could get her to allow me even to examine them. After a time I got her consent to fill, provided I did not use gold. We were then using oxychlorid of zinc as a filling material, so I decided to fill with that. After cleaning out all the decay and the pulp-canals as well as I could, I mixed up the oxychlorid and forced it into the cavity. To my utter surprise and dismay I saw the gum around the fistula getting white. I knew then that there must be a passage through the tooth to the outer surface of the gum and expected very bad results; but quite to the contrary, the fistula closed up, gum became healthy looking and there never was any trouble afterward. The experience caused me to think of experimenting with oxychlorid as a root filling, and with the chlorid of zinc in the treatment of dead teeth, both of which gave most happy results; and I think I have the right to claim to be about the first, if not the first, to use these two materials in this way.

On another occasion I was cleaning out the root-canals of an upper first molar for a gentleman, when suddenly the drill went up through the tooth such a great distance that I became very much alarmed, not having any idea where it had gone. I told him the tooth was not in a condition to fill for a few days and dismissed him. I took a work on anatomy, read up on that portion of the

body, and found the drill had gone into the antrum of Highmore. More alarmed than ever at my mistake, on the return of my patient I advised extraction of the tooth. So you see how many of us had to grope in the dark to find the information we required; the result of which has been the founding of colleges all over this and other countries for the proper education of dentists, so that to-day we stand as an educated body of men in our specialty; yet, although we have made such wonderful progress, we are far from perfect. So far as my observation goes, no matter how much we know or think we know there is room for much more. It was for this reason that, after fifteen years of practice, I entered the New York College of Dentistry, going through it as a regular student, and graduating in 1876. I never have had occasion to regret it.

At the time I entered the profession we had but very few conveniences such as we have now; no dental engines, no cabinets, no fine chairs, no rubber-dam, no dental materia medica—in fact, nothing as compared to the present time. We were not regarded as professional men, and even to-day the public, in general, do not know our standing as such. We therefore owe it to ourselves to instruct them whenever we can.

Discussion. Dr. Sailer: I feel very much gratified at the opportunity of hearing such a pleasant and comprehensive paper; it is instructive in more that one sense. It gives our younger members here encouragement. Now in my younger days I should have appreciated it very much if I had had a gentleman get up and talk to me, face to face, in such a commonsense and friendly manner, and tell me all of his youthful failures. It would have given me great encouragement, because I was unfortunate myself when I first started out.

Dr. Swift: One thing that struck me forcibly in Dr. Tenison's paper was the lesson it held for the younger men—and I still class myself among the younger members, although I have been practicing now nearly twelve years—the indomitable will that Dr. Tenison showed, for instance, when he put that gold filling in in Paris, never having put one in before. I feel we would all do well to have just that sort of feeling and confidence.

Dr. Hart: The thought occurred to me during the reading of the paper that we are all very fortunate to-day, in that we have definite standards to live up to in the practice of our profession. Former practitioners created certain high standards, and the profession at

large tries to live up to them, and though the pendulum has swung from the early root fillers and the oxychlorid of zinc used by Dr. Tenison to the many remedies advocated nowadays, the former still hold an important place in our affections and in our practice.

Dr. Tenison: I failed to speak of one thing—the dense ignorance that sometimes marked the practice of those earlier days of dentistry. A gentleman, whose father graduated in 1835 and was a practicing dentist in Pittsfield, Mass., related to me the following incident. His father was called upon one day to fill a tooth with gold. At that time, I believe, there was a sort of amalgam used, which, melting at a very low degree of heat, was formed into the cavity to be filled. This man, supposing gold was to be treated in the same way, melted the gold and poured it into the patient's tooth, and there was a terrible time in town about it. This happened about 1835, so you see we have improved somewhat in our method of filling teeth.

Dr. Chickerio (the President): In my experience as an instructor I have found that ignorance is by no means confined to the patients, but is shared as well by those practicing dentistry. In 1887-8 one of the men who studied with me had occasion to make a rubber case. In trying to run the vulcanizer, instead of applying the heat at the base, he applied the flame to the thermometer. Needless to say, the mercury went up like a shot.

AMALGAM AND ITS USES.

By J. E. Adams, D.D.S., Paris, Ill. Read Before Eastern Illinois Dental Society, March 16, 1897.

Amalgam was first introduced into this country for filling teeth in 1833, and since that time unlimited discussion has arisen among the general practitioners of medicine, as well as dentistry, in regard to the practicability of utilizing this material in dentistry. From the very first the better class of practitioners waged war against it on general principles, not alone on account of the supposed deleterious effects of the mercury contained in its composition, but because of its unsightly appearance. In short, it has been charged and credited with defects and qualities which would indicate that it is at once the worst and best material for filling teeth in existence.

It has been and is yet comparatively easy to save well calcified teeth by filling with gold or other material, but the conditions are changing. With these poorly calcified teeth we have to look to

their preservation first and artistic methods and effects afterward. Cements are good and I would recommend their use extensively in temporary fillings. Gutta-percha is good only in a few positions. Tin, while one of the best tooth preservers we have, has the same objection to it as gold in manner of manipulation and is too soft to wear well.

We have no filling that is practical in every case; it would be just as absurd to fill all teeth with one kind of filling as to treat all diseases with one remedy. The first and most important consideration in selecting material for a particular tooth would be structure of tooth; second, position of tooth and cavity. Gold of all filling materials probably heads the list, but on account of mode and force required in manipulating I consider it the proper filling to use only in strong, well calcified teeth, and in cavities easy of access.

Amalgam on the other hand is suggested to me for such cavities and teeth as gold is not adapted for—teeth of soft structure and cavities difficult of access. Amalgam is the only plastic metal filling we have; it is compatible with tooth structure, has comparatively low conducting power, and is easily introduced into cavities. None of the agents used in filling has excited so much discussion; no material is in more common use, and many cases are presented where such a filling seems the only one practicable. An amalgam that will retain its color, and not shrink when properly manipulated, is second to no material as a tooth preserver. We have all seen teeth filled with this material that have been effectively preserved from decay for fifteen to twenty-five years, and just as good as when first inserted.

The success of an amalgam filling depends largely upon the way in which it is manipulated; too much mercury is sure to destroy the setting properties, while some claim that too little favors disintegration of the filling. I feel very sure that the proper way is to work the filling dry, either by squeezing out the excess before filling or wiping out excess as the operation proceeds. Amalgam has been much abused, for, being so readily prepared and inserted, it has caused a great deal of careless operating, but gold no more carefully used would not make so good a filling. Defective manipulation is one of the most potent causes of failure, whatever material may be used.

The preparation of a cavity for an amalgam filling is distinctly different from almost any other. The walls of most cavities should

be straight, the enamel walls parallel and not beveled, all angles drilled out, and the cavity enlarged within; while amalgam will permit of more soft tissue in cavity, and defects which would be of no consequence with amalgam are sure to cause failure with gold. Nevertheless, the preparation should be thorough.

No amalgam has yet been produced that will leave a smooth surface after insertion, and too much care cannot be taken in finishing, especially at the gum margin. Yet we so often find overhanging almost enough to fill the cavity proper. The best time for finishing is two or three days after the filling is put in, as then it is hard and will take on a better finish without danger of breaking or crumbling. The mercury used should be the best redistilled; the success of the filling depends largely upon this and the thorough mixing. I consider the matrix almost indispensable in all approximal cavities; it makes a difficult cavity simple and lessens the danger of overhanging walls at the gum border.

GAINING ACCESS TO AND REMOVING DEVITALIZED PULP.

By C. H. Tillotson, D.D.S., Mattoon, Ill. Read before Eastern Illinois Dental Society, March 16, 1897.

We find pulp exposures from almost every aspect of the teeth. While some localities are simple enough of access with little cutting, many are difficult and perplexing to the operator and trying to the patient. It is these many difficult and out-of-the-way exposures I desire to discuss.

Frequent places for these points of exposure to occur are at the distal cervix of the second upper and lower molars, the cavity of decay very often being induced by the third molar abutting against its neighbor in such a way as to leave or form badly shaped interdental spaces, in which food lodges, is retained, and allowed to remain and ferment. These cavities are often of small circumference, yet penetrating deep enough to enter the pulp-chamber.

After allaying the irritation and controlling the pain we devitalize the pulp. This brings us to the stage where it is necessary to gain free access to the pulp-chamber and canals. We must cut forward to a point on a line with the canals in order to be able to introduce and withdraw the broach easily. It is desirable and commendable to cut farther than this at times for the purpose of flooding the cavity

with light if possible, so that we may readily and clearly see all parts of the cavity. While we advocate the conservation of tooth substance, we cannot work in the dark without necessarily guessing at what we are doing.

This brings us to the place where we have to begin cutting. I am often amazed at the varying methods offered by different dentists. I have listened to those who earnestly advocate the use of gouge chisels for cleaving the enamel, and hand-burs for removing the dentin and entering the pulp-chamber and canals, saying they have no use for the engine for this work. Others say they use the steel burs altogether with the engine for cutting both enamel and dentin. Experience, however, has taught me that nothing can give me and my patients the same satisfaction for heavy cutting as grinding away the overhanging walls with sharp, keen, grit corundum points, kept wet with water.

These I am in the habit of molding at the chair or elsewhere, as I need them, from new corundum by softening a small piece and placing it upon a mandril or worn bur or drill. Then, passing it through the flame of the spirit lamp until the shellac is partially melted, mold it deftly between the thumb and finger, and while yet soft place in handpiece and revolve under light pressure to true up.

This grinding with corundum has advantages over the steel bur, inasmuch as it does not heat or jar the tooth so much and will grind enamel faster than a bur will chip it; this once removed, the bur may be employed to cut the dentin. After grinding the walls until parallel with the base of the pulp-chamber, or farther if necessary, we enter the orifice of the canal with cone-shaped burs and follow with a drill. If the work has been thoroughly performed up to this point very little delay will be experienced in removing the debris and pulp. We very often find that pulp tissue is tender and sensitive to the touch even after making repeated applications of arsenic. This seems to be especially true in the buccal canals of the upper and the anterior canals of the lower molars, and to get them under better control we have achieved good results from introducing cocain full strength in combination with eugenol or chlorid of zinc, carrying it far into the canal on a fine barbed broach, and in tortuous canals resort to the use of sodium and potassium, which disintegrates and disorganizes the pulp tissue and tends to expel the particles from the canal, when they can be readily syringed away. In employing

this or any powerful remedy the rubber-dam must always be in position and a platinum broach used to convey the sodium and potassium.

Having gone this far into the discussion of this subject I don't feel that I will have fully conveyed the intention of this paper by stopping here, and so must digress a little from the subject in speaking of the imperfect operations we all find in this class of work, generally spoken of as pulp cases. It will be understood that the purpose of removing the pulp from the teeth under discussion is to get them in condition for filling, and how often it happens that we find the root-canals very imperfectly opened and filled. I don't know how to make myself more clearly understood than by referring to a case or two out of many which have come under my observation. The most prominent in my mind just now was that of a gentleman of foreign birth who applied to be relieved from pain in his jaws, as he stated. Upon examination found a number of large amalgam fillings in the molars and bicuspids. I suggested that the trouble came from those teeth—that it was more than likely they had been filled too close to the pulp; but he informed me the pulp had been destroyed and taken out of all of them. I could see the cavities had not been cut back sufficiently to make it possible to reach the canals, and after convincing him of this he directed that I remedy the trouble. I began by removing a large amalgam filling from the distal surface of a third lower molar, and as I had anticipated, found that an *effort* had been made to clear the canals and fill them, with the result that the pulp-chamber was stuffed with cotton and the canals open save for the presence of debris. I opened the cavity thoroughly, cleansed canals, and in due time filled them and the crown. Each of the several fillings which I removed presented the same general condition. I was interested to know where and by whom the work had been done, and was informed at Copenhagen, Denmark, by an operator who styled himself an American dentist. When asked how long it took this American dentist to complete the work, four or five cavities, the reply was, only a few hours and all at one sitting, and he added they had not ceased to give trouble ever since. The cost was about $1.50 each in United States money. I told him that it would take me longer than that to prepare and fill one of them, and that each one would cost him nearly four times that amount. When I had completed his work he remarked he would hate to do that amount of work for so little money.

dentist, who told him he had an alveolar abcess and had been opening pus pockets along the line of the anterior fracture.

The same evening had a consultation with family physician and decided to send patient to hospital. We could not get a history of any injury at the time, but later the patient remembered of being struck twice in the face, once six months before and the second time some months later, but had forgotten all about it.

October 23 he was operated on by hospital surgeon, writer not being present. An opening was made just under the tempo. max. art. and a probe passed down along the posterior edge of the ramus and out under the external angle of the jaw. Some pus was found down deep under the masseter muscle, so a rubber drainage tube was passed through and left in place. The surgeons present had considerable amusement at the dentist's fracture, they claiming there was no fracture of the jaw. The next day, however, they were convinced that there was a fracture, as there were five teeth loose, collectively but not individually.

Pus kept discharging from the line of anterior fracture, but in a few days patient was discharged from the hospital, improved.

December 30 saw patient. Face badly swollen. Ether was given, and with the assistance of the surgeon on duty at the hospital I operated. Opened in the old incision. With finger placed in upper opening, found the ramus rough and all bare of periosteum; the coronoid process was loose from the body of the bone. Passed finger in from below until fingers met and found an old fracture across the ramus. Removed the external angle and the most of the ramus. Could feel a good deal of rough bone, but saw I would have to do too much injury to the soft parts if it were all removed. Smoothed down rough edges and packed with iodiform gauze. Expected to operate again in a few days as soon as the dead bone became loose. Put him on K. I. gr. 5 t. i. d., and tincture gentian comp. 3i t. i. d.

January 10, 1896. Patient improving. Some pus and considerable dead bone. Inject daily about Mx of aromatic sulfuric acid in upper opening and let it run out of lower. Consider it does a great deal of good, removes the sharp edges of bone and keeps down the excessive granulations.

Recovery slow but uninterrupted, and no further operation necessary. All closed up, no sinus and but little deformity. In this case the surgeons or dentist did not recognize the fracture until the patient became septic, and even under ether the fracture was not recognized by the surgeons who operated the first time.

To sum up my argument, we are aware this kind of work is done here in the United States and the same miserable fees charged for it, and I hope to hear an expression from you how this class of work should be performed and what should be a fair remuneration for the time, care, patience and judgment necessary to perform these operations well and satisfactorily to both our patients and ourselves.

"IT IS SAID."

By G. Alden Mills, D.D.S., New York.

Dr. I. A. Freeman, on p. 145 of the March Digest, says "It is said that Riggs' disease, not yet known as pyorrhea alveolaris, was incurable, and I believe it was rarely ever treated, as with those instruments it was impossible to remove deposits situated below the gums without nearly murdering the patient."

I must say to Dr. Freeman that I have often watched the late Dr. Riggs from the start to finish in dealing with as difficult and hopeless cases as any operator attempts to-day, so that the statement should not be made that "it was rarely ever treated." Furthermore, the Riggs instruments should not be denounced as "murderous" to the patient without observation of their proper use by an expert, which would allay Dr. Freeman's fears in this respect and would change his opinion as to their not reaching the deposits in most locations, even to the apex. Constant handling of these instruments for twenty-three years, first learning their use in Dr. Riggs' office, gives me the right to make these remarks, and to add a tribute to the unusual skill which Dr. Riggs displayed and introduced.

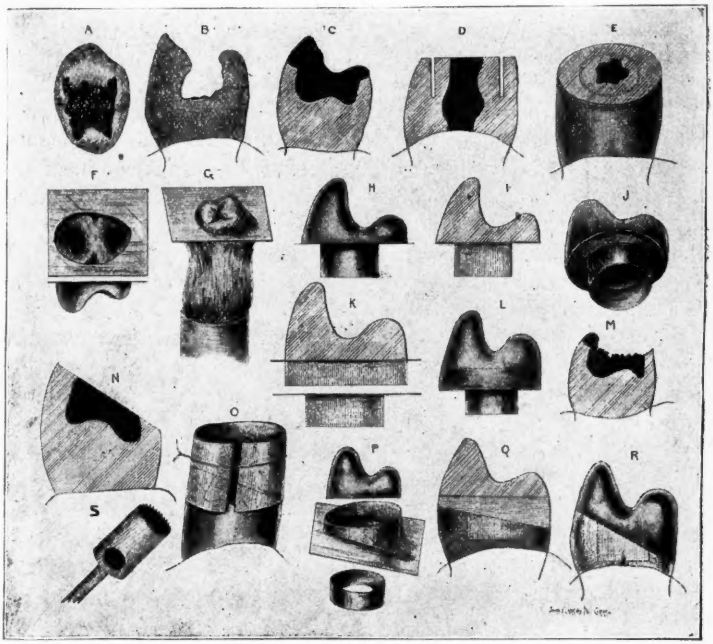
CASE OF FRACTURE AND TREATMENT.

By M. C. Smith, D.D.S., Lynn, Mass.

October 20, 1895, was called to see E. I. Found patient with a badly swollen face, left side. Temperature 101, and a decidedly septic look. Tongue coated. Had had no sleep for several days and was suffering a good deal of pain. Found a fracture of the inferior maxillary down between the left lateral and central, through the alveolar ridge, and then backward, between the alveolar process and the body of the jaw, and up between the first and second molars, and probably a fracture through the ramus.

History of the case. Patient had been suffering for almost two weeks. Had consulted three or four doctors and been daily to his

select a cusp which will in shape and size completely restore the portion of the tooth cut down; after selecting the latter with reference to natural occlusion produce in the usual manner the swaged or solid gold complement, Fig. *F*. If you desire a good swaged cusp fashion the pure gold cusp outline and flow into it 22k gold solder; trim off the overhanging portions of the gold and solder the cusp to a small piece of plate gold, Fig. *G*; this gives you a swaged cusp



thoroughly sealed at the cusp margin and will answer the same purpose as the solid gold cusp. Next use a trephine, Fig. *S*, such as is employed by Drs. Walker or Younger in the operation of implantation, and cut a circular opening into the occlusal surface of the tooth, Fig *E*; fit into this opening a complementary gold ferrule a trifle wider than the depth of the circular cavity and position it; next paint the exposed portion of this intradental ferrule with either rouge or gum arabic, and by fastening the occlusal surface of the gold cusp

Digests.

METHOD OF MOUNTING GOLD CUSPS ON BROKEN-DOWN BICUSPIDS AND MOLARS. By B. J. Cigrand, B.S., D.D.S., Chicago. Read before Odontographic Society. Few dental operations which we are called upon to perform demand a keener judgment than cases where the occlusal surfaces of teeth are badly decayed, and present conditions somewhat unfavorable for a large gold filling, and at the same time suggest the possibility of a crown.

The method which I have the pleasure of describing this evening is one that will save tooth structure very considerably, does not interfere with the normal conditions of the interspaces, and permits of a healthy growth of the gum septum, since it does not invade this region, and in consequence affords all possible freedom to the gingiva. The process of constructing a cope by this method may at first sight appear difficult and even intricate, but I assure you upon closer acquaintance with the process it will prove to be simple indeed, and will appeal to those who intend to avoid the consequences of a barrel crown.

I will consume but little of your time in delineating the several steps in the production of the dental cope. Its application is found advantageous in the case in question, and particularly so when the dentist is tempted to position an "all gold crown." It not infrequently happens that teeth decayed as is shown in Figs. *A* and *B* are presented for restoration, and the difficulty of inserting what is known as an Ottolengui gold filling would require an unusual amount of time and subject the patient to a severe task, to say nothing about exacting from them a considerable remuneration, and the latter enters into the circumstances as a potential factor in many cases. To properly reconstruct cusps on a gold filling, as in Fig. *C*, will completely tax the ingenuity and patience of any operator, while by the method proposed the work is materially simplified, without serious detraction from durability and usefulness. We begin by placing the rubber dam in place, cut out the decayed contents of the cavity, shape it for an occlusal surface amalgam filling; permit the filling to set, after which grind or trim off the entire occlusal surface to a point corresponding to the cusp margin, as in Fig. *D*. Then with the aid of the Hollingsworth cusp buttons proceed to

on a stick of wood by means of wax it can be readily brought to its relative position on the intradental ferrule—the rouge will mark the line of contact, or if you have used the gum arabic the ferrule will come forth with the gold cusp. Now solder the ferrule to the cusp by using a small amount of 18k gold solder, Figs. *H* and *I*, and the whole is, after the usual trimming, ready to be anchored to the natural tooth with a cement which is free from grit and of a slow setting character. Permit the cement to completely set, and then with cuttlefish disks proceed to polish the gold cusp to conform accurately to the tooth. If the tooth be considerably wasted away a band may be added to the cusp button, as in Fig. K; then solder the piece of gold plate to the free border of the extending band, and to this fasten the intradental ferrule, as in Fig. *L*. This system of building up the occlusal surfaces of teeth does not confine itself to bicuspids alone but to the molars as well; but on account of the similarity of the operation it will be needless to explain the latter process. Should any pulp or apical troubles arise the case can be readily treated intradentally, since access to the pulp-chamber can be easily had, there being no obstructing post.

In bicuspids whose lingual or palatal surfaces are extensively decayed it can be built up as in Fig. *N*, after which place about the tooth a gold band held loosely in position by means of copper wire, as in Fig. *O;* then with a long hoe-shaped instrument the obliquity of the tooth is registered. Now remove the band, bring the edges in apposition and solder, trim off at the point indicated by the hoe-scratch and solder to it a piece of gold, trim off the excess metal and reposition on the tooth to cut off the occlusal edge as for a telescope crown. Remove same, attach the gold cusp and affix the intradental ferrule, and you have what is represented in Fig. *P*, and when in position as in Figs. *Q* and *R*.

This latter method can be employed in anchoring a buccal-bridge denture and avoids completely encapsuling the sound bicuspid, as is the practice generally. I have not as yet produced the cope in porcelain, but there appears to be a favorable condition in some cases which might permit of the use of porcelain; such cusps if they prove sufficiently strong would restore the tooth admirably. It would necessitate, however, that the base of the cope be made of platinum and that considerable of the occlusal surface demanded restoration, since a thin cusp or veneer would result in failure; and I

quote the language of Dr. Taggart on this: "The more you engage in porcelain work the more artistic you desire to be, providing you do not sacrifice strength. To attain this end we must use a greater bulk of porcelain, and I have learned by experience that porcelain for grinding surfaces must be in bulk."

The entire cope can be constructed out of the mouth if an impression of the case is taken subsequent to trimming down the natural tooth. Pour the impressions in metal and proceed as already directed.—*Dental Review, March, 1897.*

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INFLUENCE OF CONSTITUTIONAL DISTURBANCES UPON THE TEETH. At a recent meeting of the Berlin Society for Internal Medicine, Neumann discussed the influence exerted by constitutional diseases upon the state of the teeth. He pointed out that rachitic erosions occur symmetrically upon different teeth at varying levels through interference with the process of calcification. The deciduous teeth may also be eroded, but only at the same places as the permanent teeth. The erosions may in some instances begin before birth, but as a rule they take place during the first five months of life. The morbid process on which they depend terminates in 54 per cent of cases in the second half of the first year of life, in 38 per cent in the second year, and in 6 per cent at a later period. Many theories have been invoked to explain these erosions, but none is adequate. The lesions occur as the result of a morbid process continuing at least for several months and frequently longer. They bear no relation to syphilis and are dependent exclusively upon rachitis, and upon that special form involving the bones of the head. They are exceedingly common, being found on the permanent teeth in 18 per cent of children and on the teeth of 54 per cent of children dying during the second half of the first year of life. The teeth peculiar to hereditary syphilis differ from rachitic teeth in the disease not being local, but consisting in a malformation of the entire tooth. The impression that only the upper median incisors are affected is not correct. Such teeth are characterized by standing far apart, by being rotated on their axes, by standing in divergent relations with each other and by malformation of the crown. They are not common. The malformation occurs between the seventh month of fetal life and from the third to the fifth month of extra-uterine existence. It does not involve the deciduous teeth, because the rudi-

ments of these are formed at a time when syphilis of the fetus usually results in abortion. The common form of caries begins on the incisor and gradually invades the surface of the entire tooth. It bears no relation to rachitis. It reaches its maximum of development during the second year. It is often observed in connection with chronic disease of the nervous system, especially idiocy. Circular caries is characterized by early discoloration of the teeth at the gingival margin. Caries of the neck takes place and progresses deeply until the distal extremity of the tooth is cut off, leaving an unrecognizable root. It occurs in connection with grave disease, especially tuberculosis, of which it is diagnostic.—*Berliner kl. Wochenschrift, Jan., 1897.*

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FUNCTIONS OF MUCOUS MEMBRANES. Dr. Thomas H. Manley, of New York, in an instructive article on the general and special features of the anatomy and histology of mucous membranes, thus enumerates their functions:

1. The mucous membranes and their epithelial prolongations serve as a protective mantle to the less highly vitalized elements beneath.

2. Most of them possess the dual property of taking up and discharging various substances. With their glandular equipments in the mucosa, they occupy a leading position in all the vital and chemical changes in the body; in tissue metabolism, degenerative and regenerative processes, their place is a dominant one.

3. In the healthy state of the system they provide formidable barriers against germ invasion or against the introduction into the system of putrescent noxious elements. With their serried, close columns of epithelial cells, they resist the ingress of, or, at all events, neutralize or destroy in a large measure, lethal elements in the atmosphere and in the food we consume.

4. The regenerative power of the mucous membrane and its epithelia is most extraordinary. This is commonly noted in the parts most exposed to trauma and the action of chemical irritants, as in the mouth, the respiratory passages, the stomach, the rectum, the urinary and the gall bladder. In the genital organs of a woman it is most remarkable.

5. Neither the urinary nor the gall bladder have any mucous glands. Repeated experiments have quite conclusively demonstrated that the normal urinary bladder possesses no absorbing power; none

to poisons in solution, except the corrosive irritants. It is probable that the colon absorbs very little or none of its own contents, and it still remains a much-disputed question whether or not the rectum and sigmoid flexure can absorb and assimilate non-digested proteids, or carbohydrates.

6. The mucous membranes in most situations constantly shed the wornout surface epithelium.—*Medical and Surgical Reporter.*

* * *

SUCCESSFUL CASE OF EXTERNAL ESOPHAGOTOMY FOR IMPACTED TOOTH PLATE. By W. T. Bull, M.D., and J. B. Walker, M.D., New York. C. L——, woman, single, 40 years old, native of Scotland, in previous good health, noticed after a slight fainting attack that an upper plate carrying two false teeth had disappeared. This was in November, 1894. The plate was of platinum, one and one-fourth inches long, three-quarters of an inch broad, irregularly indented in front, and provided with two half-circles of small wire for hooking on to the sound teeth. There was trifling pain, but next day she could swallow nothing. Dr. C. F. Barker, of Newport, R. I., found it impossible to pass a bristle probang farther than six inches. The following day liquids were swallowed, and slight swelling and tenderness were detected just above the sternal notch. The facility of swallowing increased, and she could take solid food at the end of five or six weeks. The local swelling disappeared after a few days. She had no marked difficulty and no disturbance of her general health till toward April, 1896, eighteen months from the time the plate was swallowed. Then dysphagia was noticed, with loss of flesh and strength, and feebleness and hoarseness of the voice. In four months, March to July, 1896, her weight decreased from 120 to 90 pounds, and she took only liquid food. About the middle of July I saw the patient. She was thin, anemic, weak; able to go about, but not to work. Pulse 80; temperature 98.5° F. Palpation revealed nothing, and no sort of esophageal bougie could be passed beyond a point about seven inches from the teeth. No laryngoscopic examination was made. Rectal feeding was added to the nourishment by mouth for five days previous to operation. External esophagotomy was done July 27, 1896 (twenty-two months after the accident) with the help of Dr. Barker and the staff of the Newport Hospital. The esophagus was exposed readily on the left side through tissues that showed no trace of in-

flammation, but the body could not be felt by the finger. The esophagus was opened just above the sternum upon a bougie, and the edges of the incision were held apart by loops of silk. The wall was healthy here. An inch lower, behind the first part of the sternum, all exploring instruments were at first arrested, apparently by soft tissues. Eventually a whalebone passed through to the stomach along the anterior wall, and a probe beside it entered a pouch in the posterior wall and grated against the plate. The esophageal wound was enlarged downward till its entire length was about one and one-half inches, and the plate grasped with a curved artery clamp; but it could not be easily extracted until the mucous membrane in front of it had been cut with scissors. These manipulations were somewhat prolonged and difficult from the interposition of the sternum. It was evident that the plate had sunk into the posterior wall and been lodged, with its long diameter vertical, in a sort of pouch of the mucous membrane, which had ulcerated at one point, leaving only the upper and lower end of the plate exposed in the lumen. The wound was lightly stuffed with iodoform gauze about a large soft-rubber catheter, which reached four inches below the site of the foreign body and was brought through the dressing of sterilized gauze. The operation lasted two hours.

No vomiting followed. The temperature was 101° F., with pulse 110 for a few hours next day; then ranged from 98.5° to 99° F., with pulse of 80. For twenty-four hours only rectal feeding was resorted to; then three or four times in twenty-four hours fluids, beginning with four ounces of boiled water, were introduced through the catheter without any stomach irritation. The mouth was frequently irrigated, but nothing swallowed. Occasional cough and expectoration of mucus were quieted with small doses of morphine hypodermically. The iodoform packing about the catheter was changed three times in the first ten days, when the catheter was withdrawn and replaced by a clean one. On the thirteenth day the wound was much contracted and granulating well, and the catheter was withdrawn, leaving only a light wick of gauze down to the esophagus. Up to this time there had been no escape of esophageal or stomach secretions in the wound. In forty-eight hours after removing the catheter nourishment was administered through the stomach tube, passed twice a day; then swallowing was permitted and rectal feeding discontinued. The esophageal wound had appar-

ently closed, for none of the swallowed fluids escaped. The sinus was healed entirely at the end of seven weeks, the patient having been out of bed at the end of a week. From the end of the fourth week a No. 19 (English) esophageal bougie was passed, and this or a No. 20 introduced on alternate days during the next month. There was a rapid gain in flesh. The voice remained rather feeble and hoarse and laryngoscopic examination made by Dr. Powell showed the left vocal cord to be motionless. For this the faradic current was given for several weeks, with gradual restoration of the voice to its natural strength and clearness, according to the patient's statement and that of her friends; but no subsequent examination of the throat was made. Four months after the operation her condition was perfectly satisfactory.—*Medical Record, March, 1897.*

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ORAL SURGERY. By Edmund W. Roughton, B. S., M. D. (Lond.), F.R.C.S. Eng. Deformities of the Mouth. As the mode of origin of harelip, cleft palate and macrostoma is unintelligible without some knowledge of the method of development of the parts concerned, it will be well to recall to mind the chief features in the process.

The prominent part of the nose and the front part of the nasal septum are developed from the fronto-nasal process, descending from the base of the skull between the rudimentary eyes. This bifurcates below into two mesial nasal processes. They coalesce in the middle line to form the intermaxillary bone with the incisor teeth, the central part of the upper lip and the columna nasi. Outside them on each side is a depression which forms the nasal orifices, and outside these again are the lateral nasal processes which form the alæ nasi. The remainder of the face above the mouth is formed by the superior maxillary plates, which grow forward and inward to coalesce with the nasal processes. The lower jaw and the soft parts covering it are formed in like manner by two inferior maxillary plates advancing from each side and coalescing in the middle line. The superior and inferior maxillary processes of each side coalesce to a great extent but not completely, the gap left forming the mouth.

The mode of origin of the various deformities under consideration will now be readily understood. If one superior maxillary process fails to unite with the fronto-nasal process, a fissure will be left through the upper lip to one side of the middle line, forming a single

harelip. If both superior maxillary plates fail to unite with the fronto-nasal process a double harelip results, the intermaxillary bone being often left adherent to the tip of the nose and the nasal septum. A large median harelip is the result of arrest of development of the fronto-nasal process. A small and incomplete median cleft may result from the failure of the two median nasal process to unite. When the palatal processes of the superior maxillary plates fail to unite the result is a cleft palate. This condition may exist alone or in combination with any varieties of harelip.

Macrostoma, or congenital transverse fissure of the face, is due to arrested coalescence of the superior and inferior maxillary plates.

Harelip. The different varieties of harelip have already been sufficiently indicated in a preceding paragraph. The fissure may be little more than a mere notch in the edge of the lip. More often, however, it extends more deeply into the substance of the lip, or even completely into the nostril. The deformity is much more often single than double, and occurs on the left side more often than the right. The two margins of the cleft are unequal in length; the mesial is often rounded, the outer somewhat flattened. In double harelip the central portion is often shorter than the lateral portions of the lip and projects further forward; incisors much in advance of the other teeth, due to elongation of the intermaxillary process.

Treatment. The deformity must be remedied by a plastic operation. The best age for operation is between three and five months. Very young children stand hemorrhage badly. Dentition begins soon after five months and may seriously interfere with the success of the operation. It is important that the child should be in as good a state of health as possible. The surgeon aims at obtaining primary union, thereby closing up the gap with the smallest amount of scarring. The necessary incisions should be made with a very sharp knife to avoid bruising the tissues; the edges of the cleft should be pared sufficiently to leave broad raw surfaces, which should be concave toward the middle line of the cleft so as to lengthen the line of union; the lip should be freed from the gum at the apex of the cleft so as to avoid tension; and great care should be taken to insure accurate adaptation of the raw surfaces, especially at the free margin of the lip. The details of the operation vary considerably, according as the cleft is single or double, or complicated by protrusion of the intermaxillary process.

Operation for Single Harelip. The lip having been compressed on either side of the cleft by a suitable clamp to control hemorrhage, the surgeon first frees the lip from the gum at the angle of the cleft; he then pares the edges with a sharp fine scalpel, taking care to remove the whole of the rounded portion of the prolabium on each side of the base of the cleft. The raw surfaces are then brought into accurate apposition by means of two harelip pins. The lower pin should be passed first, and should be made to transfix the coronary artery, care being taken that the pin does not penetrate the mucous membrane, and double in a fold of it between the pared edges; being satisfied that the first pin brings the margin of the prolabium accurately into line, the upper one is passed in the same way and a silk suture twisted round each. The ends of the pins are then cut off with pliers, and a small pad of gauze placed under each to prevent injury to the cheek; several horse-hair sutures are then inserted to complete the apposition. The parts are then dried and covered with collodion, and a piece of strapping applied from cheek to cheek to support the lip and prevent traction when the child cries. In cases in which the cleft is not very wide or deep, silk-worm gut sutures may be used instead of harelip pins; when the latter are used they should be removed after twenty-four to thirty-six hours; if left longer they will produce scars. The twisted silk suture is not disturbed by removing the pins, and should be left adhering to the lip until firm union has taken place. When the fissure does not extend through the whole lip Nelaton's operation may be performed. This consists in making an inverted V-shaped incision with its angle just above the apex of the cleft, each arm stopping short of the prolabium. The tissues below the incision are then drawn down, leaving a diamond-shaped wound; on bringing the raw surfaces together by passing a suture or harelip pin horizontally, a projection on the border of the lip will be produced in place of the original cleft; this disappears in time, leaving the margin straight.

Operation for Double Harelip. This is conducted on the same principle as that for single harelip. When the premaxillary process projects, it should not be removed unless it is very small and too much out of place to be made use of; it is better, if possible, to force it back into place by partially dividing its base of attachment, or by removing a wedge-shaped piece from the septum of the nose. The

central piece of lip should be completely pared; two flaps are then cut from the lateral portions, and brought down and united to each other below the central part; the latter is sutured to the two united lateral pieces.

Cleft Palate. This results from failure of the palatal processes of the superior maxillary plates to unite with each other in the middle line and with the premaxillary bone in front. The cleft may be complete, extending through the middle of the uvula, soft palate and hard palate, and through the alveolar process at the line of suture on one or both sides of the premaxillary bone, or it may involve the uvula alone, or the whole length of the soft palate, or a portion of the hard palate as well. The lower border of the vomer may be free in the cleft or attached to either margin. The malformation interferes very much with the functions of the mouth. On swallowing fluids regurgitation takes place through the nose. Infants with cleft palate are unable to suck, and consequently die unless carefully fed by hand. Speech is nasal and indistinct, and taste and smell may also be impaired.

Treatment. The infant must be fed by means of a feeding-bottle with a nipple large enough to act as a plug to the cleft, or by a spoon passed well to the back of the mouth. The mother's milk should be used if possible. The operation should be performed before the child begins to speak, but not in early infancy, as the cleft often diminishes in width during the first two or three years of life. Moreover, infants bear hemorrhage badly, and are very apt to catch cold and to disturb the parts by coughing and sneezing. Three years is the most suitable age for the operation. The cleft in the hard and soft palate should be dealt with at the same time.

Staphylorrhaphy, or closure of the soft palate. Chloroform having been administered, the mouth is widely opened and the tongue depressed by a Smith's gag. The edges of the cleft are then pared from below upward. The two halves of the uvula and the lower part of the soft palate are united by horse-hair sutures and the upper part by silver wire. The latter is passed by means of Smith's needle, which has a small reel attached behind the handle to hold the wire, and a serrated wheel half-way up the handle to protrude the wire from its tubular point. The parts having been brought into accurate apposition, the tension is relieved by making incisions through each side of the soft palate parallel to the cleft and just

internal to the hamular process. These incisions secure rest for the opposed surfaces by dividing the palatal muscles.

Uranoplasty, or closure of the hard palate. The edges of the cleft having been pared, an incision about half an inch long should be made through the muco-periosteum of the palate on each side of and parallel to the cleft, taking care to avoid the palatine artery. A raspatory is inserted into one of these incisions and the muco-periosteum separated from the bone along the whole length of the cleft. The muco-periosteum is then detached from the posterior margin of the hard palate with curved scissors, one blade being passed through the cleft and the other behind the soft palate while the latter is drawn forward. The same process is then repeated on the opposite side. Silver-wire sutures are then introduced and the raw edges of the cleft brought into apposition. Tension is relieved by prolonging the cuts forward or backward as may be necessary. Hemorrhage is arrested during the operation by sponge-pressure, care being taken to let the blood flow out of the mouth from time to time by turning the head over to one side, and to see that none of it enters and occludes the larynx. In the after-treatment every care must be taken to keep the palate at rest. The patient should be fed for the first few days on iced milk, and on soft food for another fortnight. He should swallow with as little effort as possible, and speaking should be strictly forbidden until union is complete. The stitches may be left in for three weeks or a month, but should be removed sooner if they produce irritation. The surgeon hopes that the whole cleft will unite by first intention, but not infrequently a portion of it may fail to unite at once, but may to a large extent close by granulation. When a small circular aperture remains it may often be healed by stimulating its margin with nitrate of silver or the actual cautery. If a large gap remains a second operation must be performed.

Speech is sometimes perfectly restored, but the voice usually remains more or less nasal. This is due to two causes—first to faulty habit of articulation, and second to the fact that the repaired soft palate is too short in its antero-posterior measurement to completely shut off the naso-pharynx. The first cause may be to a large extent corrected by careful instruction in elocution, but the second is of necessity irremediable.

Macrostoma. Macrostoma, or congenital transverse fissure of the face, results from arrested coalescence of the superior and inferior

maxillary processes. The cleft extends from the angle of the mouth to the anterior border of the masseter, or even up to the external auditory meatus. In such cases the external ear on the affected side is malformed, the tragus being detached from the auricle, forming a small lobulated excrescence on the cheek; the helix is often twisted and curled inward. This deformity is treated on the same general principles as harelip, the edges being pared and united by harelip pins and twisted sutures.

Atresia Oris. This condition may result from excessive coalescence of the superior and inferior maxillary processes, or may be the result of sloughing of the lips. Treatment consists in performing a plastic operation.—*British Journal of Dental Science, Feb., 1897.*

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MISFITTING VULCANITE PLATES. By Stewart J. Spencer, D.D.S., Harriman, Tenn. I have sometimes remedied misfits in vulcanite plates by the simple process of warming them until somewhat softened, and then allowing them to cool slowly. This warming may be done over the flame, but better, I think, in hot water. Surrounded by water, the heat is perhaps more equally distributed through the plate than when it is held over the flame. The theory is, that heat permits the plate to return to its normal shape, the shape given it by the model, if it has lost it.

It was celluloid which gave me this idea. Like many others, I was a victim of the celluloid epidemic of the eighties. One day, on boiling a celluloid plate to remove the teeth from it, I observed that it relapsed into nearly the original shape, that in which it was furnished at the depot, the "blank." I then tried molding celluloid plates at a higher heat, about 300°, if I remember rightly, and found that these plates would not, when afterwards softened in hot water, return to their "blank" shape, but (if purposely bent for the sake of experiment) would return nearly to the form given them by the plaster cast. This suggested warming misfitting vulcanite plates to restore them to shape, if warped.

The process, however, fails in those dentures which have a new layer of vulcanite over an older one, as when an old plate has been refitted. I presume that the failure is due to the fact that, when subjected to this process, the older vulcanite draws in the direction given it by the original investment, and the newer in the direction given it by the later investment, and that these two are opposed to

each other. Indeed, I am disposed to believe that this opposition acts on these plates when cooling in the vulcanizer, producing misfits. Perhaps this could be prevented by sawing out the entire palatal portion of the older vulcanite.—*Items of Interest, Feb., 1897.*

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SYPHILITIC AND TUBERCULOUS INFECTION OF THE MOUTH. By Dr. J. W. Russell, Brooklyn, N. Y. Read at 2nd District Society, Oct., 1896. In syphilitic infection of the mouth there are two dangers: first, the transmission of syphilis from one patient to another; second, the infection of the dentist through some cut or abrasion on his fingers.

A short time ago there were reported a number of cases where the primary sore, or chancre, was found in the mouth, tonsils and throat. We all know how this is caused in a certain class, but where the patient is known to be of a high moral character, and in the cases of women whose purity is undoubted, the theory of sexual infection must be excluded.

The saliva of a syphilitic is rarely dangerous until the appearance of secondary symptoms, say from two to three months after inoculation. One of the most important of secondary symptoms is the mucous patch in the mouth and throat, yet I have seen a number of cases of true syphilis where the mouth appeared perfectly healthy. Herein lies the danger: it is so easy to use the mouth-mirror, which of course has been wiped off after a fashion, to examine the next mouth. If there should happen to be an abrasion, how easy it would be to inoculate the patient. Even an abrasion is not necessary, because the crypts of the tonsils are peculiarly susceptible to the syphilitic germ, and any floating in the saliva would lodge there. It would be almost impossible to give facts to support these assertions, because no one could tell exactly at what time he was inoculated. Nevertheless, the fact remains that the shiftless cleansing of mouth-mirrors and instruments exposes patients to great danger.

The question, how long is the saliva of a syphilitic capable of communicating the disease to another, is extremely difficult to answer, but I believe that it is wise to exercise great care until the tertiary symptoms are on the wane. This varies from one to three years after the primary lesion.

How are we to know that a patient has syphilis, if there are no lesions in the mouth? If the patient or the family physician does

not tell, there is no way of knowing, hence the greater necessity for the absolute sterilization of every instrument that goes into the mouth. The number of offices where the mouth-mirror is not sterilized before passing from one mouth to another is beyond enumeration.

The danger to the dentist is not imaginary, for if he has any cut or abrasion on his fingers, and they are moistened by the patient's saliva, he stands a good chance a few weeks later of developing a chancre. The number of physicians and nurses who have acquired syphilis from inoculation, through the medium of patients' secretions, is not small, and there is no reason why dentists should be exempt.

That tuberculosis is an infectious disease has been demonstrated beyond all doubt. It has been proven that a comparatively healthy person may become inoculated with this disease, through the mouth or nasal passages, and in some cases die in a few months. How far is the dentist responsible? We all have tuberculous patients, and there is great danger that we may assist transmission. Their saliva swarms with the tubercle bacilli, and these, when removed to a new field, multiply with rapidity.—*Items of Interest, Jan., 1897.*

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INTERNAL CARIES. By J. H. Bland, D.D.S., Pueblo, Colo. About six months ago a lady called upon me, suffering intense pain, which she located in the region of the left superior cuspid. I made a thorough examination, but could find no cavity in the cuspid, and as all of her other teeth appeared to be perfectly sound, I diagnosticated the pain as of neuralgic origin and advised a consultation with her physician. He failed to give her any relief, and she returned to me for another examination, which, however, was made without throwing any light upon the mystery. Two months later she again returned, having suffered continuously in the interval, but having at last discovered a rough place upon the suspected cuspid. Upon examination I then detected the most minute cavity at the extreme point of the cutting edge, and upon enlarging was amazed to find the dentin so soft that it could be removed readily with a spoon excavator. I further enlarged the opening, and eventually removed all of the dentin to a line well below the gum margin. A curious factor in the case, which accounts for the continuous pain, was that the pulp had receded as rapidly as the caries had progressed, and was still alive when all decay had been removed. Will someone endeavor to explain this most remarkable case?

[Years ago a similar instance occurred in my own practice. I was using a fine explorer in examining a set of teeth, when the point passed into a minute cavity, in the sulcus of a first superior bicuspid, and to my astonishment, when I endeavored to withdraw the explorer the entire natural crown came away. Upon examining I found that the dentin had been entirely destroyed, and was readily scooped out, leaving the enamel in the form of a hollow cup, with no trace of dentin adherent. In this instance the pulp had died. This case has always been a mystery to me, but is now readily explainable in the light of Dr. Williams's recent discoveries. It is to be observed that in both cases, when the cavity finally showed, it was upon the masticating surface. Dr. Williams has found many instances of imperfections in enamel, unapparent to the human eye, but quite large enough to permit the passage of the corrosive acids excreted by the microorganisms which lie upon the surface of the tooth. These microscopic fissures in enamel usually reach the masticating surface. Again, there are not infrequently imperfections within the apparently solid portion of the tooth structure, and one slide shown by Dr. Williams disclosed such an internal space, in process of decay, and filled with microorganisms, yet connected with the surface by a microscopic passage, by which the microorganisms undoubtedly entered.—Editor].—*Items of Interest, Feb., 1897.*

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APPLICATION OF THE X-RAY IN DENTAL SURGERY. By P. M. Jones, M.D., San Francisco. Before the Stomatological Club, Nov. 3, 1896. Naturally you, gentlemen, are particularly interested in the application of X-rays to dental surgery, and in knowing to what extent they will aid you, and I will therefore confine my remarks to that particular phase of the subject. Sciagraphs can be made showing the shadows of both upper and lower jaws, and either side of the jaws, with the teeth in proper relation with their bony sockets. The roots of the teeth, being of denser material than the bone invaginating them, show clearly throughout their whole extent. As with bone in other parts, diseased conditions so change its absorption of X-rays that the diseased area exhibits a shadow differing from that cast by normal bone, and consequently necrosis, tuberculosis, or exostosis of the jaws may be very readily diagnosed. The presence or absence of a small particle of root remaining after extraction, or the location of the end of a broken

drill may be quickly ascertained from a sciagraph of the suspected portion of the jaw. It has been claimed by some Eastern investigators that health or disease of the pulp may be shown by the X-ray shadows, but of this I have no personal knowledge.

As an illustration of the usefulness of the X-ray examination, I recall a case I saw in consultation about two years ago. The patient, a boy of 15, had had a lower molar extracted in Australia some two or three years before. Since that time there had been recurrences of swelling and an inflammatory process of the gum at the site of the extracted tooth. Several skillful dentists had examined, cut and probed, looking to find a piece of the root of the extracted tooth, but always without success. At least a dozen examinations of that sort had been made under cocain. Chloroform was given, a free incision made, the bone opened and two pieces of root removed, and the trouble entirely disappeared. In such cases as that the presence of the root fragments could be ascertained in a moment by means of the X-ray, and the numerous painful inflammations and examinations spared the patient.

For differential diagnosis of troubles involving the nerves or other soft parts the X-rays are practically useless, but with bone or hard structure the diagnosis is removed beyond the question of opinion and is a presentation of actual facts.

In the matter of the physical aspect of the rays, little more is definitely known now than was announced by Prof. Roentgen. There are three theories advanced to explain the nature of the rays: (1) that they are longitudinal ether waves; (2) that they are ultra-violet rays; (3) that they are streams of projected material particles. Most physicists hold to either one of the first two, the majority rather inclining toward belief in the theory of longitudinal ether waves.—*Pacific Stomatological Gazette, March, 1897.*

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ACTION OF ARSENIOUS ACID UPON THE TOOTH-PULP. By H. Prinz, D.D.S., St. Louis, Mo. There is probably no remedial agent in the whole dental materia medica which is so universally used in the process of devitalization of the tooth-pulp as arsenious acid. Dr. Spooner, of the *Dominion Kingdom*, in 1836 called first attention to this particular effect and published a formula which has stood the test of more than half a century and is used to-day, either as the original compound or in various modifications. Occa-

sionally corrections have been suggested so as to render the application of the remedy to some extent painless, morphia-salts being preferred by many. The narcotic value of the drug in such compounds is rather doubtful; cocain as a local anesthetic has a decided advantage over the opium alkaloid. Wood charcoal, as a diluent, and cobalt (cobalt arsenatis), as a substitute, have been highly praised at different periods by their advocates. The fact remains nevertheless unaltered, the arsenious acid is the only potent factor.

The mode and form of application varies with different practitioners. A paste made of the acid by aid of some liquefying agent, such as cresote, phenol or etherial oils, is almost universally used now. The action of the acid upon the pulp is two-fold: first, as a caustic, and second, as an anesthetic. But how this effect is produced has been rather questionable, and is still the cause of frequent discussions, and only shows the vital importance of the subject. Arkoevy makes the statement that, "After the application of the arsenious acid upon the pulp the blood-vessels dilate, the contents therein disintegrate, the connective tissue-fibers become extended, and the myelin of the nerve-fiber breaks up in nodules, while the axis-cylinders disappear entirely. The structure of the dentin remains unaltered." Baume and Schlenker do not confirm the last assertion.

Another hypothesis brought forward demonstrates the formation of a hyperemia produced by the arsenious acid, with resulting strangulation of the nerve-fibers near the apical foramen. This is not correct. We may, with the same effect, cauterize the pulps in young molars where the roots are not nearly fully developed. It should not be practiced, however. The arsenic may, by passing through the foramen, involve the periosteum and surrounding tissues, resulting in necrosis of the affected portion.

To ascertain the pharmaco-dynamic effect of arsenious acid some fundamental facts have been brought forward by the investigation of Bing and Schuly. They claim that the protoplasm in some forms of dead and living tissues has the power to interchange constantly the atoms of oxygen which adhere to the arsenic, viz., to convert the arsenious acid (As_2O_3) in arsenic acid (As_2O_4) and vice versa. This permanent interchange of both the acids, this perpetual oxidation and reduction within the molecules of albumen, causes a violent to-and-fro vibration of the atoms of oxygen, and is the cause of the poisonous and the therapeutical effect. The metalloid arsenic acts

merely as the carrying factor of the active molecules of oxygen, which resembles somewhat the caustic properties of nitrogen dioxid (N_2O_4) and nitrogen terroxid (N_2O_3), the nitrogen itself being here the transporting medium.

Fibehue regards the members of the arsenic-phosphorus-antimony group as not remedial agents proper. Only such tissue as is directly diseased, or such as carries the pathological germ within will die, viz., by the action of arsenic. On the healthy mucous membrane (in animal experiments) arsenic has no effect—in the animal, however, poisoned with arsenic, where the cells have therefore lost their resistance, the arsenic will cauterize the mucous lining.

From experiments carried on in the laboratories of the dental college in Vienna (Prof. Scheff) we learn that if the arsenical paste is brought in direct contact with the spread out mesentery of a frog a momentary stasis of the circulation will result. Microscopical pictures showed most of the capillaries overfilled with clotted blood; few were found empty. The nodules in the vessel wall seemed to be somewhat extended. Healthy pulps of freshly-extracted teeth were subjected to the same treatment. After preparing them for histological researches they showed, in most cases, a closer coherence of the nodules in the capillaries and the vessels themselves were seemingly thinner and presented a wave-like appearance.

Diseased pulps were also subjected to the influence of the arsenical paste for twenty-four hours continuously. In longitudinal sections the specimens represented a picture somewhat different from the normal pulps. The capillaries were almost constantly filled with blood. The corpuscles, being brought in dense contact, looked similar to fibrin-coagulum. In some of the peripheral vessels the clot represented a conglomerate of disintegrated blood-disks and fibrin masses. The excessive accumulation had extended the lumen of the vessels abnormally. In a pathological pulp there is always inflammation and as an accompanying phenomenon hyperemia is present. From the foregoing experiments the conclusions may be drawn—*that the complete stasis of the circulation is the immediate result of the action of the arsenical paste. In consequence of the stasis in the capillaries of the pulps the nerve-endings and probably the nerve-branches lose their specific physiological action, and in this way produce the analgesic effect.*

Heronan, in his text-book on physiology, explains this in the

following manner: In a totally different relation to the circulation as the nerve itself remain the central organs of the nerves and the peripheral end-organs; stasis, viz., the prolonged interruption of arterial circulation, produces a much quicker disturbance of functions than in the muscles.

After the application of the arsenical paste the whole pulp will probably not break down; the newly-formed scab does not permit of deeper penetration of the caustic. Intoxication, perhaps, is excluded. The rapidly-formed scab prevents further involving of the whole pulp, and this accounts for the still painful sensation which our patients experience at the extirpation of the minute stumps from the root-canals. The quantity of arsenious acid applied to a tooth-pulp varies to some extent; we may say one-twentieth of a grain is the maximum amount in each individual case. More than two teeth should not be submitted to treatment at one sitting, so as to prevent any possibility of accidentally swallowing a large amount of the drug. Resulting failures are due to faulty application or perhaps to idiosyncracy.—*Dental Register, March, 1897.*

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CONTINUOUS GUM. By L. P. Haskell, Chicago. Continuous gum is, par excellence, the denture of to-day. The strongest, most durable, most natural in appearance, most healthy to the oral tissues, and most cleanly of all full dentures. The matter of weight I do not consider a factor in making an upper denture. If the case be properly made and adjusted in the mouth, the patient does not realize whether it weighs a pennyweight or an ounce. This I can affirm after forty-three years use of the continuous-gum denture.

The impression should always be taken in plaster. No vacuum chambers nor suction devices of any sort are needed. Cases may be made for the flattest ridgeless jaws and the highest vaults. The only change in the model, as a rule, is a "relief" over the hard palate of a thin film of wax, extending well onto the anterior ridge and nearly to the posterior margin of the plate, so as to prevent rocking of the plate.

In this work, as in all others, the plate should be worn as high as possible, over the cuspids higher than elsewhere. The margin should always be wired with a flat wire soldered edgewise to the plate, beginning at the right side and soldering an inch at a time, making a *close* joint. This is easily done, using common iron wire

for clamps, clamping at two points at first. The posterior margin of the plate should be reinforced with a doubler, one-quarter inch wide, gauge 30, extending around the tuberosities. The inner margin of the doubler should be turned up a very little, to protect the margin of the porcelain. This turned-up edge should extend only to the top of the ridge; where it is met by the wire of the outer rim. The doubler should be soldered first. The wire should not run across the heel, as it is unsightly and unnecessary. A mere trifle of borax is needed simply to guide the flow of the solder. The solder should always be twenty-four-carat gold.

In arranging the teeth the roots can be cut off when necessary with side-cutting pliers. Little grinding is needed, just sufficient to let the tooth rest on the plate.

Invest in plaster and asbestos, equal parts, first applying a thin coat of plaster to the teeth, filling the interstices. After removing the wax make patterns of lead (Japan tea lead is the best) in three sections, one covering the anterior teeth and the others the posterior, but lapping over the cuspids, so when soldered it is a continuous backing, firmly anchoring the teeth to the plate. There should be a foot-piece to the backings about one-eighth inch wide, lying flat on the plate. The backings may be the same thickness as the plate. By slitting the foot-piece several times it can be more easily adjusted. For pressing the backing into place I use a worn-out rubber scraper. Use very thin twenty-four-carat gold for solder, cut in pieces three-sixteenths inch square, picking it up with a sharp-pointed instrument. No borax is needed, as the gold is laid under the foot-piece and under the pins, which are bent down close to the backing.

When using a coke or oil furnace I soldered in the furnace. Since using the electric furnace I heat the case as hot as possible over a gas heater, then solder with compressed air or an automatic blow-pipe. When cold, remove the investment after soaking; wash thoroughly; no soap or alcohol is needed.

I use the Close materials for body and enamel exclusively, as they are thoroughly reliable. The first application should be made very wet, so as to be easily worked into all the interstices around and under the teeth back of the backings, jarring with the spatula, and absorbing with a cloth all excess of moisture. Absorb with the cloth most of the moisture from the material in the dish and apply with the spatula (which is straight and pointed at one end, curved

and pointed at the other, and the only steel instrument needed), holding the case upside down. The material should be packed hard, building up to the full contour, always fullest over the cuspids; jar with the spatula to bring excess of moisture to the surface, and absorb; then dry partially over the Bunsen burner or spirit-lamp. For trimming and contouring nothing equals a quill toothpick, thin and flexible, which trims around the necks of the teeth and removes all material from between. With a stiff, dry brush remove all chips, and with a small, soft camel's-hair pencil, wetting for each tooth, deftly draw it around the neck of each tooth.

With the curved end of the spatula apply the material to the palatal surface, packing thoroughly around the necks of the teeth, and a very thin coating over the surface, jarring, absorbing, drying, and trimming. Here taste can be exercised in making the lingual necks of the bicuspids and molars longer than the teeth represented, and also convexing the surfaces of the bicuspids to correspond with nature. This first application of the material should be as complete as if it were the last, as the material shrinks and the shrinkage should be complete at this baking.

The introduction of the Custer electric oven has simplified this work very much. The case is placed in the furnace without drying and the heat turned on slowly. This should not be a full bake (glossy), but only a strong glaze. The case should always be placed on the plaster cast after soldering and also after the first bake, to see if it has sprung; if so, press it back into place. There is no liability of springing in the last bake. When cool, wet the case thoroughly and apply material very wet, jarring thoroughly to fill the crevices; then with denser material replace the shrinkage, form the rugæ, finish as at first, and bake this time to a gloss.

Upon cooling, apply the gum enamel, of a consistency to be applied with the spatula, about one thirty-second inch in thickness and uniform; jar slightly and absorb; dry partially and trim with the wet brush around the necks of the teeth. The palatal surface needs a thinner coat than the labial. Bake to a *gloss*. The case can always be placed in a cold muffle to cool. Finish with files, fine sandpaper, small felt wheels with pumice and oil, and finally soft brush and whiting or rouge.

A lower plate should be doubled around the margin one-eighth inch wide and no wiring, allowing the porcelain to come flush with

a solution of acetanilid—all with equally good results. The method of procedure is practically the same as that for the anesthetizing of sensitive dentin. After applying the dam or napkin, the cavity and canals are flooded with alcohol and thoroughly dried. A pledget of cotton saturated with the antiseptic to be used is placed in the cavity, and the platinum point of the positive electrode placed upon it. The tooth being devoid of sensation, the current can be raised to the necessary strength in a very short time. An application of from fifteen to twenty volts for about fifteen minutes has been found sufficient. This is followed by an application of iodin (also cataphorically) to the gum for a few minutes, and in no case has a second treatment been found necessary to allay the pain and inflammation and place the tooth in a condition favorable for filling.

The treatment of alveolar abscess by electrolysis of a metallic electrode, after the plan suggested by Dr. W. J. Morton, is an important consideration. A small elongated bulb of zinc is fused onto a platinum wire which, in an insulated handle, forms the positive electrode. This bulb should receive a coating of mercury before each application. It is then inserted into the fistula or incision, the negative electrode held in the patient's hand, and the current applied. The electrolytic action of the current dissolves a small portion of the zinc bulb, and we have deposited within the abscess-cavity a quantity of the chlorids of mercury and of zinc. If the application of the current causes pain, a few drops of a cocain solution may be taken up on the zinc electrode and introduced with it into the opening. Cataphoric anesthesia is thus obtained in combination with the electrolysis. By this method abscesses, long chronic, may be cured with two or three treatments. In the treatment of pyorrhea the electric current is a valuable acquisition, both as a means of intensifying the action of such agents as are used in the treatment of that condition and for the stimulating action of the current itself upon the tissues. In illustration of the foregoing methods of treatment, I submit the records of a few cases:

Case 1.—A lower molar had contained a large crown filling for a number of years. Last summer during the patient's stay at the seashore pulpitis developed, and the filling was removed and the pulp destroyed by the seashore dentist. A few hours after filling, however, severe pain occurred in the region of the tooth, and was relieved only by the removal of the filling. A few days later another

the edge. The reason for this is the liability of needed relief at the margins sooner or later; the case would not *appear* marred, as it would if ground or filed through a wire.

Many have given up the use of continuous-gum work on account of the difficulty they had in repairing. If properly proceeded with this is a simple matter. The case must first be imbedded in plaster and asbestos one-half inch deep, heated very slowly to a red heat. When cool, and the investment removed, there is no danger of cracking. Then grind out the remains of tooth to be replaced and a portion of the gum. Select a tooth or teeth (rubber teeth are suitable for repair). No soldering is needed. If only one tooth, pack some material (lower fusing than the original) around it and carefully place in the furnace; bring up the heat gradually to a good glaze. After cooling apply the enamel. If several teeth are replaced, hold them in place with a light coat of plaster and asbestos over the ends or half way down and extending onto the adjoining teeth. If only the corner of a tooth is broken off, repair with the easily fusing material. If there are cracks in the enamel, grind into them and fill with body.—*Dental Cosmos, Feb., 1897.*

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CATAPHORESIS AND ELECTROLYSIS IN THE TREATMENT OF PERIDENTAL INFLAMMATION. By John M. Fogg, D.D.S., Philadelphia. Notwithstanding the fact that the original experiments in cataphoresis had for their object other lines of local medication, all, or nearly all of the recent investigations and developments of cataphoric medication have been in the line of anesthetizing sensitive dentin and of bleaching teeth. As a consequence of this tendency, a very important application of the principles of cataphoresis and electrolysis has received too little attention. I refer to the inflammations in the peridental region arising from various causes, and the gratifying results to be met with in their treatment with the help of the electric current. The most frequent of these conditions is probably that of chronic pericementitis, the cause of which is so often found in the imperfect sterilization of root-canals at the time of filling. By the introduction of antiseptic agents cataphorically through the canals we have at once a remedy for this condition. It matters little which antiseptic we employ, so long as its conductivity of the current is favorable. I have used for this purpose hydrogen dioxid, oil of cassia, chlorid of zinc, and

sufficient importance to justify its mention. The patient had for some time been under her physician's care for a violent case of facial neuralgia, which treatment failed to relieve. About a year ago the pain having to some extent become localized in the maxillary region, she was advised to consult a dentist. A very careful examination failed, however, to reveal any dental disorder, and she returned to the physician. From that time until within two or three months her suffering had been incessant. Another dental examination was made with the same result as the first. The pain was centralized in the right superior maxilla and was reflected to the inferior maxilla, the orbital, the temporal, and the occipital regions of the right side. A neuritis of one of the dental branches of the superior maxillary division of the fifth nerve was diagnosed, and a cataphoric application of tr. aconite was made on the gum over the upper first molar, using the rubber-cup electrode. On the following day the pain had disappeared, nor has there been any recurrence. The details of one case afford rather insufficient grounds upon which to base any positive statement as to the value of any method of treatment, but the case in question was such a typical one, the result so decided, and the cure effected so apparently permanent, that the writer deems it worthy of consideration.—*Dental Cosmos, Feb., 1897.*

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DENTAL OPERATIONS DURING PREGNANCY. By H. J. Custer, B.L., D.D.S., M.D., Johnstown, Ohio. Read at Ohio State Society, December, 1896. Several years ago a young married lady of lymphatic temperament presented to have a superior lateral incisor filled with gold. Nothing was said regarding her condition, but circumstances indicated the first weeks of pregnancy, and a cement filling was accordingly advised. The patient insisted upon a gold filling, which was finally agreed upon. The cutting of the sensitive dentin apparently caused but little pain, in fact, the several steps of the operation were accomplished with but little discomfort until a finishing strip was introduced, when the first and only rasp caused a momentary muscular paroxysm. After a few moments interval the filling was completed by the aid of disks and the lady left the office without much depression and well satisfied with the operation. The second day after the operation, however, uterine contractions were established, and after several days of rather serious illness an abortion of about the tenth week was completed.

filling was inserted with the same result. This process was repeated three or four times, until finally the attempt to save the tooth was abandoned. When I saw the case in the autumn the tooth was very loose and sensitive to pressure, the gum inflamed and swollen. An application of hydrogen dioxid was made as described above, followed by an application of iodin to the gum, and the canals and the crown cavity were then filled. In two days the soreness and inflammation had subsided, the tooth had become firm in its socket and could be used with perfect comfort, and after an interval of five months remains in the same satisfactory condition, having given no trouble in the meantime. Attention is called to the fact that, previous to this treatment, a filling was not tolerated in this tooth for more than two or three hours at a time.

Case 2.—Presented conditions very nearly the same as the foregoing, with the addition of a chronic abscess. This was treated through the canals in the same manner and the iodin application made to the gum, with the same favorable result. This tooth had been condemned to extraction before this treatment.

Case 3.—Necrosis in the alveolus of an upper bicuspid, the result of a chronic abscess. The fistula was enlarged with carbolic acid and the cavity cleansed. Cotton was then wound on the platinum point of the positive electrode, saturated with aromatic sulfuric acid, and applied within the fistula. A current of twelve volts was used for ten minutes, an antiseptic dressing made, and the case dismissed. Upon the next examination, two weeks later, the fistula was found to have healed and the tissues presented a healthy appearance. The patient told me this case had resisted other treatment for a year.

Case 4.—Chronic alveolar abscess, upper bicuspid. After syringing with hydrogen dioxid, the zinc electrode was inserted in the fistula and a current of fifteen volts applied for ten minutes. This application caused slight pain, which soon disappeared. At the next visit, a week later, the case presented marked improvement. The swelling had subsided and the fistula was nearly closed. An application of iodin was made to the gum to reduce the slight inflammation which still existed, and at a subsequent visit a cure was found to have resulted.

One other instance in which cataphoresis was found to be of especial value was in a case of facial neuralgia, and while it is not strictly within the limits of the title of this communication, seems to possess

Having briefly considered the possible tendencies of dental irritation, let us now inquire into their relation to the causes of abortion. According to Lusk, "The underlying causes of abortion, miscarriage and premature delivery are the same. Causes of abortion are rarely of sudden occurrence. Usually the way is prepared either by changes occurring in the ovum or by certain pathological conditions affecting the mother. In either of these ways a disposition to abortion is produced. When once, as a result of morbid changes, the attachment of the ovum to the uterus has been rendered insecure, causes usually inoperative suffice to determine uterine contractions and the time at which the expulsion occurs. * * * "The disposition to abortion may be due primarily to any disease of the chorion, such as syphilitic degeneration of the villi. In most cases, however, death of the fetus precedes and leads to disease of the chorion." Therefore the causes of abortion are in large measure causes which produce death of the fetus, which having occurred, is followed by expulsion of the ovum, not usually at once, but after a longer or shorter period of time. "There is also a class of women in whom there is neither disease of the ovum nor of the genital organs and yet pregnancy is interrupted, according to present information, from certain personal conditions of nerve irritability. Psychical and physical excitement which would be of small moment in some women, in them is sufficient to empty the uterus."

Recalling the percentage of women with pelvic trouble, and consequently more or less predisposition to abort, the exciting causes should now specially interest us. There is first, *hyperemia of the gravid uterus.* When predisposing causes have weakened the attachment of the ovum to the decidua, *anything* which determines the blood currents to the uterus is liable to produce extravasations of blood around the ovum and awaken uterine contractions, the contents usually being expelled at an early date; or the hemorrhage may be intraplacental, or into the serotina, or into the uterine sinuses. The extravasated blood usually undergoes the ordinary metamorphosis, and the pressure upon the villi produced by the extravasations impairs the nutrition of the fetus and may cause its death, in which instance the expulsion might occur weeks after the exciting cause has operated.

As a second exciting cause, there may be uterine *contraction pro-*

That very serious results do sometimes follow dental operations during the period of gestation is evidenced by the best authorities and by detailed reports of such occurrences. But after investigating the literature upon the subject it seems that the dangers of this period are not generally comprehended, for nearly all the reported cases show abortion to have occurred very soon after dental irritation; and secondly, a number of practitioners testify that they have practiced many years and never knew any trouble to follow; which, while the dentist is perfectly conscientious, would seem to imply that an abortion must follow soon after operation, while the following would seem to indicate that detrimental influences to the fetus, or an abortion, may follow weeks or even months later as a result of irritation, and the dentist loses sight of the case.

In the first place reliable gynecologists conservatively say that at least 70 per cent of all adult females are afflicted with some disease or diseases of one or more of the generative organs. Consequently there is a very prevalent predisposition to abortion. Further investigation shows that nervous reflexes dependent upon diseases of the generative organs frequently aggravate and may cause insanity. Conversely, eminent psychologists testify that nervous and mental diseases often seriously interfere with the functions of the reproductive system, while amenorrhea and premature expulsion of the uterine contents as a result of prolonged anxiety, fright, pain, grief, or strong mental emotion are not uncommonly reported, and there are many abortions other than criminal, whose occurrence is shielded from public notoriety. Hegel reports "one abortion for every eight or ten full-term deliveries." Women who have a diseased uterus, ovaries, tubes, or a pelvic cellulitis complain of neuralgic pains, which frequently find expression in the trigeminus. Gestation is often accompanied by toothache, while the pains of parturition have been known to alternate with pain in the teeth. Pregnancy, which primarily is a physiological condition, on account of the prevalence of pelvic disease often assumes more or less of a pathological nature, and during disease the reflexes are especially liable to be perverted and irregular. From the foregoing clinical observations it would appear that the reproductive organs maintain such intimate communication with other regions, and are so susceptible to reflexes, that it is necessary to press the button but slightly in the region of the trigeminus to precipitate a calamity of no inconsiderable proportions.

entirely dependent upon nutrition, while present but meager information would rather confirm the theory. We may also add that the accompanying fever can in no way contribute to the welfare of either mother or child.

There now remain for consideration *the several reflexes unassociated with shock.* When the trigeminus is irritated, even in health, there is no telling whether any decided reflex will be instituted, or, if any, whether it will be secretory, muscular, vasomotor, or possibly trophic. Or perhaps all the reflexes may operate more or less at the same time. Of these reflexes that of *muscular contraction* is much to be feared, the results being the same as uterine contraction from shock. And it is well worth remembering that nerve centers have the power of augmentation of reflexes, and that reflex muscular contractions are more sustained than those produced by direct stimulus of muscular nerves. Consequently, a blow upon the abdomen might cause a gravid uterus to contract but momentarily, while a stimulus to a nerve center through a centripetal nerve may excite reflex contractions lasting for some time after cessation of stimulus.

Vaso-motor reflexes may produce either dilatation or constriction of the vessels. If the constrictor reflex were but transient the resulting anemia would probably cause no serious disturbance, while the hyperemia of a dilator reflex would be attended with the same dangers previously described under shock.

Regarding the management of these cases, it would seem well to avoid operations during the third, fourth and eighth months of pregnancy, and also during those periods when menstruation would ordinarily occur, for, according to Spiegelberg, these periods are especially risky.

The common method of palliative treatment and temporary fillings will dispose of a large number. But there are some cases of difficult cavities with exposed pulps, phagadenic pericementitis, abscess, impacted third molars, and possibly other complications where non-interference might produce the very results which we are so anxious to avoid.

Cataphoresis and other obtunding agents and the careful approach and manipulation of the dentist all exercise an exceedingly beneficial influence, but the mind still remains active and susceptible and the nerve centers on the alert for reflexes. Something is

duced by influences which act directly through the nerves, such as are produced by powerful mental emotions. The results of this process are usually soon apparent. However, the contractions may not be sufficient to cause a final result at once. The ovum may change position within the uterus and the abortion be incomplete. Or again, the blood extravasated around the ovum or into the tissues may not bring the case to a final issue for weeks or even months.

Circulatory disturbances and *muscular contractions*, with the possibility of detrimental trophic changes, are then conditions to be especially avoided during pregnancy. As dentists we may unintentionally and indeed unavoidably produce the two former and perhaps the latter conditions as a result of *shock*. The reflexes of either physical or mental shock may stimulate the uterus to contraction, and probably this cause is responsible for most cases of immediate abortion, or those for which we may be held responsible. Investigating the pathology of shock, we find that one condition, though not a constant one, is *an engorgement of the abdominal veins from vaso-motor paralysis*. As before shown, this condition is very dangerous to the gravid uterus and the ultimate results may occur early or be obscured by the future. Shock as most often seen by the dentist is of the immediate variety and frequently observed before the patient leaves the chair.

But there is another variety, an insidious form of shock in which the symptoms appear rather late and are out of all proportion to the gravity of the injury. The patient may leave the office apparently calm and unaffected; may have a good color; quiet pulse and respiration; and nothing appear wrong. But a little later insomnia develops; the pulse becomes soft, quick and rapid; there may be chills followed by fever; and the depression may last for days and weeks perhaps only to terminate in some nervous disorder. Several times during hospital experience I have witnessed this form of shock and have had the opportunity of observing every detail of two such cases occurring in my own practice. Fortunately both cases were only moderately severe and occurred in young unmarried ladies. These cases of latent shock or depression sometimes occur unknown to the dentist and cannot prove other than very injurious during gestation. Besides the liability to circulatory changes and uterine contractions, since the nervous irritability is long continued, there is no evidence contradicting a *trophic disturbance*, especially in a process so

needed to diminish both mental and physical nervous susceptibility. The combination of whisky and morphin as mentioned by Dr. Marshall is an excellent agent to administer, but many women are so prejudiced against alcoholics that they will refuse them, but at the same time accept other poisons in proportionately larger doses. Antikamnia and condein are good preparations, as also are migrain tablets of acetanilido monobromated camphor and citrate of caffein. A full dose of chlorodyn just before operating produces good results. All of these agents reduce the sensibility to pain and give ease to the mind. But the one remedy which I have used most frequently during the past two years is bromidia, of which each fluid dram contains 15 grs. each of chloral hydrate and potassium bromid and one-eighth gr. each of ex. cannabis indica and hyoscyamus. This preparation lowers the activity of the nervo-muscular apparatus which controls uterine contractions; and being hypnotic, antispasmodic, analgesic and anesthetic, it diminishes both physical and mental reflex activity, also producing a pleasing mental condition. Chloranodyn is fully as efficient as bromidia, but it is more inconvenient to administer. If the patient is very nervous I usually begin two or three days before the operation with one-half teaspoonful of bromidia four times a day. Just before operating I note the time of last dose and condition of patient and then give perhaps double the former dose, since the effects will be antagonized by the operation. To a number of patients, pregnant and otherwise, who previously occupied the chair in a condition of continual nervous and muscular tension, I have administered these agents, with the satisfaction of rendering the patients mentally and physically tranquil in the chair with no unpleasant results following.

Regarding the extraction of teeth, unless general anesthesia be induced the child in utero would be jeopardized, while only the ordinary mortality from anesthesia would apply to the mother. If the operation indicates severe pain and the patient be reasonably favorable to anesthesia, observing the usual rules for choice and contraindications, it would certainly be implied, remembering specially that fatty degeneration and dilatation of the heart, advanced pulmonary disease, and acute nephritis are proper causes for inducing abortion, and also contraindicate anesthesia. In these cases we may operate without anesthesia, and if an abortion follows it is from justifiable causes.—*Ohio Dental Journal, March, 1897.*

EXOSTOSIS. By Douglas E. Caush, L.D.S.I. In introducing this subject, we will draw your attention more especially to those changes that are observed in the microscopical examination of teeth, and to make ourselves clear we state the method of preparing teeth for examination. If the tooth has been out of the mouth for some time, it is at once cut into sections with a fret saw, commencing at the apex of the root; each section being made as thin as possible, and as cut off it is placed in a watch glass containing water. If, on the other hand, the tooth has been recently extracted, we place it in an alcoholic solution of rubin and allow it to remain for some weeks, so that the colored solution may penetrate into the tubuli and any other spaces that are to be found in the tooth; it is then cut and prepared in the same manner as the dry sections, and by this method very beautiful, as well as very perfect sections, showing tubuli, etc., may be obtained.

After the sections are thin enough for examination we stain them by what we call the surface method. It is done as follows:—Into a watch glass, containing an aqueous solution of rubin, the section is placed for about two minutes, then taken out and the surface moisture dried from the section, which is then mounted in hardened Canada balsam. By adopting this method the section becomes stained in the following manner: All soft tissue wherever found is stained a deep red color; the cementum is stained red; the dentin does not take up the stain at all, and thus we have a perfect differentiation of the tissues. Having described the method of preparing our slides, we will now direct your attention to some of the changes that can be observed. To better understand the changes it is well to keep clearly in mind the normal condition of the tissues. The first change that takes place in the development of exostosis is that of the thickening of the alveolar-dental membrane. This is usually caused by some slight irritation; it may be from a filling, or alteration of the articulation, produced either by decay or the loss of other teeth, or from some similar cause. In all cases the result is the same, namely, an increase in the blood supply to the part; this, in its turn, causes increased activity in the cells of the membrane.

Should we at any time have the opportunity of microscopically examining such a tooth, we shall find the membrane much more colored than usual, as well as increased in thickness, owing to the cells in the portion of the membrane attached to the cementum

having become more and more active. These cells continuously break up into new cells, and these new cells divide and subdivide until the membrane has a much larger number of cells than is found in its normal condition; the natural result being that a certain amount of pressure is brought to bear upon the cementum at this point. As this pressure increases from the development of the new cells, many of the cells change their character from that of an ordinary nucleated cell to that of a cementoclast or giant cell, having the power of absorbing the cementum at the point of contact. If the blood supply becomes normal at this stage no further change takes place; but should the irritation be kept up, the giant cells continue their activity. Should the condition become chronic, the giant cells thus formed will continue to absorb the cementum, until the whole of it is absorbed away, after which the giant cells pass into the granular layer of the dentin and there continue their work, until a portion or the whole of this layer is absorbed. This absorption takes place in an irregular manner, owing to the difference in the density of the tissue, the difference of density being caused by the more or less perfect calcification of the dentin; on the osteoclasts having penetrated to the denser portion of the tissue the absorption ceases, and the cells themselves again change their character from cementoclasts to cementoblasts, or cementum-depositing cells, and begin their functions of depositing cementum into the spaces previously produced by the absorption. It is not at all an unusual thing to find a number of these cells retaining their soft structure, surrounded by cementum, as if some of the cementoclasts had been slow to change their character, thus leaving portions of soft tissue in the newly-deposited cementum. The new tissue is usually deposited in layers, differing from the original cemental tissue in that it contains a large number of lacunæ and canaliculi, these frequently occupying the position previously occupied by the original layer of cementum. This layer of cementum continues to be deposited as long as the blood brings to the cells material for the development of the tissue. The amount deposited varies much; it may be but a very thin layer, or it may be continuously deposited, until it is many times as thick as the original layer of cementum.

That the development of this tissue is not always continuous may be proved by the manifestation of a number of lines in the section; in these lines we find there are few or no lacunæ, and where the cal-

cification of the new tissue is evidently much more perfect; thus showing that more perfect calcification has evidently taken place during the time of rest from development, this time of rest being caused by the cessation of the irritation to the alveolar-dental membrane, and, as a consequence, slow, but more perfect calcification of the cementum; where this has taken place, it usually leaves a structureless layer of tissue. When these lines exist they are as a rule most irregularly placed, varying much in their distance one from another, so the more continuous the deposition the fewer the lines. It is not unusual to find in some sections, after these periods of rest, that a portion of the new tissue has been absorbed away, leaving semi-lunar markings, which are filled later with new tissue.

When the development of this tissue is rapid we usually find a number of large lacunæ with their canaliculi anastomosing with the canaliculi of the surrounding lacunæ. If, on the other hand, the deposition of this tissue has been slow, the lacunæ are much smaller and fewer in number, with, as a rule, smaller canaliculi; under such circumstances the lacunæ may be isolated and surrounded by tissue, structureless in character; or should the deposition of any one portion of the tissue be more slow than that of the surrounding tissue, the same thing occurs—we get not only more perfect calcification at that point, but an irregular outline of the tissue is produced. It is not at all an unusual thing to find a number of large lacunæ formed immediately after one of these marks produced by the time of rest, the lacunæ gradually becoming less in number until there is another period of rest, so that on examining the section we are able to define the way in which the new tissue has been deposited. These changes may continue for months or even years, and leave behind them indelible markings in the tooth thus affected.

Instead of all or any of these changes taking place, the point of absorption may be very much restricted in area, or the absorption may commence at that part of the root where the calcification of the original tissue has been imperfect, and as a result of this we have a deep yet restricted area of absorption taking place. This goes on until it reaches the granular layer of the dentin, and here, frequently at that point where the absorption has reached the dentin, is a portion of softened or uncalcified tissue; this is rapidly dissolved away by the cementoclasts, and thus a deeper and somewhat semi-lunar-shaped cavity is produced. As soon as the dense tissue op-

poses the cementoclasts they cease their functions, and after a time a new tissue, cemental in character, is produced, until the whole of the space is filled with cementum. The great difference between this and the absorption, as seen in the earlier stages of exostosis, is the definite line of demarcation produced by the absorption, both in the cementum and dentin, as contrasted with the irregular line of absorption seen in general exostosis.

So far as our microscopic slides show, this form of absorption takes place nearer the neck of the tooth than exostosis usually commences; and, we think, this may be one explanation of the cause of this restricted area of absorption, all the surrounding tissue being more dense near the neck than at or near the apex of the root; it is, therefore, only when the inflammation of the alveolar-dental membrane occurs over an imperfectly calcified portion of the tooth that this absorption takes place. We have in our collection a number of slides showing that this form of absorption sometimes takes place after there has been a certain amount of general exostosis, the absorption passing through the deposited cemental tissue into the dentin, and in this space another layer of cementum is deposited. In some cases we have no doubt that this absorption is the result of a severe attack of periostitis. At the same time we must not confound these markings with those produced by the more acute form of inflammation and suppuration known as alveolar abscess.

Wherever there is a chronic abscess near or pressing upon the roots of the tooth we have absorption, and this absorption is, as a rule, more general in character and covers a larger area than in those cases known as inostosis. In these cases it is not at all unusual to find not only the cementum absorbed away, but the absorption may have gone into the dentin, and in some extreme cases we have found the absorption has not ceased until the pulp-canal has not only been reached, but even a portion of that has been absorbed away. Again, in some of these cases nature appears to have tried to produce a remedy by depositing in these depressions new tissue cemental in character.

We also find in some cases the canaliculi of the lacunæ anastomosing with some of the finer branches of the tubuli, and thus forming a network of minute canals from the cementum to the pulp-canal. We have also found, in many cases where there has been a large deposition of new tissue, that this tissue has inclosed within it

a number of canals, passing in different directions; these canals usually have a lining membrane, and to all appearances are blood-vessels of the alveolus and membrane. There is also to be found at times canals of quite another character, passing directly from the pulp-canal, at right or acute angles to the canal, through the dentin into the cementum. In this case the contents of canal are similar to the pulp itself; in some cases we have seen these canals enlarged, and a layer of cementum of varying thickness lining the canal.

These last canals lead us to the pulp, and we now draw your attention to certain changes we have found in the dentin forming the pulp-canal. It is just possible that these changes take place in teeth that are not exostosed, but as our examination has been principally of exostosed teeth, we would like others to tell if similar changes have taken place in the teeth that are not exostosed.

If we examine a tooth with an inflamed pulp we shall probably find that the following changes have taken place in the pulp:—In the layer of odontoblast cells that form the connecting link between the pulp proper and the dentin we find, at that point where the inflammation is most acute, the individual odontoblast cell has been altered in character and appearance; there is an absence of the usual processes, especially those which pass into the dentin, and instead of these we have a cell somewhat oval in shape; frequently the cells are increased in number, and apparently the connection between the dentin and these cells has ceased. This change may be restricted in area; if the inflammation of the pulp has been either very acute or chronic the cells themselves increase rapidly by cell division, and a certain amount of pressure is produced upon the dentin. The result of the cutting off of the supply of nourishment from the restricted area is to produce those transparent zones so frequently seen in microscopic sections of teeth, where there are apparently no tubuli radiating from that portion of the pulp-canal in which these changes have taken place. This may spread until the whole of the dentin between the pulp-canal and the cementum in this restricted area is apparently structureless. We believe that this change is brought about by the more perfect calcification of this portion of the dentin. Should, however, the pulp continue inflamed, we find the original odontoblastic layer becoming thickened, and after a time a number of giant cells are developed in the thickened layer; these cells pressing upon the dentin cause a certain amount of absorption

of the latter, and this absorption may be restricted to a single point, or it may be spread laterally so that two or three canals in the roots of the molar teeth may be united into one irregular canal. There appears to be no restriction as to the way in which the absorption will spread from the canals; so varied is it that almost every section shows an alteration in the conformation of the canal.

After a time another change takes place in the character of the cells forming the outer layer of the inflamed pulp; and instead of osteoclasts we have cells capable of depositing a tissue containing lacunæ and canaliculi exactly in appearance like the *cemental* tissue found on the outside of the dentin; this tissue is quite distinct in character from the surrounding dentin, and the line of demarcation between the two is usually very pronounced. This new tissue may vary very much in quantity from that of a very thin layer to a mass large enough to almost fill the pulp-canal and the spaces excavated. That this tissue is not secondary dentin, we think, will be clearly demonstrated by comparing the slides that have just passed before you and the next two, which show secondary dentin in both transverse and longitudinal sections. You will notice in the former slides the new tissue fills up *semi-lunar* spaces where the cut ends of the tubuli of the dentin end abruptly; in the secondary dentin there are no *semi-lunar* markings, and the tubuli of the secondary tissue are more or less connected with the tubuli of original dentin; in the secondary dentin the tissue is always added *directly* to old tissue without any previous absorption, and so, from the start of deposit, decreases the size of canal; this is reversed in the case of the new tissue, as the deposition is always preceded by absorption, and usually contains lacunæ and canaliculi with *no* tubuli.

That exostosis is not of recent date I lately had the opportunity of proving by a microscopical examination of two molar teeth found in the chalk debris within the artificially excavated caverns at Hayes Down, Lavant. With the teeth were associated some flint implements of the later Neolithic type; the age of the teeth probably is *not later* than 2,000 years, and perhaps much earlier. In both of them we found exostosis, and in one of them certainly excavations both on the outside of the cementum and in the pulp-canal. We have also found that these, or similar changes, *have taken place* in teeth of the horse, with even a greater intensity than in those of the human race.—*Jour. Brit. Dent. Assn., March, 1897.*

Letters.

ST. LOUIS LETTER.

ST. LOUIS, April 19, 1897.

To the Editor of the Digest,

DEAR EDITOR:—We have been so busy this month that we have not found time to collect any news, so with your permission will do a little moralizing. We are afraid that the dentists in St. Louis are not very sociable, except as two or three meet for a talk after office hours; several ones do this quite regularly. We seem each one to be so busy and so absorbed in his own affairs that we have no time to think of our neighbors, and visit them only when we go to a dental society meeting here or in some other place. However, we believe this trait is not peculiar to the St. Louis dentists, but it is to be deplored as true of the race of dentists generally. Is not this a fact? We find that men who are engaged in college or journal work are in closer touch with the whole profession, locally as well as abroad, than those who devote themselves exclusively to the practice of their calling. Any effort to raise the standard of the profession seems to draw together all those earnestly interested in that direction, and when the dentists of any community find themselves drifting apart, is it not a sign that they are forgetting the good of their fellows while attending to their own individual advancement? We, personally, are chief among sinners in this respect, so may talk. We did not intend to write so much, but have spoken because we really feel deeply on the subject. Fraternally, ST. LOUIS.

PHILADELPHIA LETTER.

PHILADELPHIA, April 17, 1897.

To the Editor of the Digest,

DEAR EDITOR:—When THE DENTAL DIGEST came on the field of journalism and I was asked to subscribe to it, I said to myself, "What do I want with another journal; also why spend more money?" On second thought I reasoned, the DIGEST is to be the mouthpiece, as it were, for the Dental Protective Association of the United States, and for this reason alone it became a duty to subscribe. This reminds me of the first time I heard of that association. One afternoon I met a "man" on Chestnut street who outlined an

association and how it could do great work, and he concluded with, "What do you think about it?" I replied, "It's all very well in theory and imagination, but how are you going to get the dentists to join; and after you have them in, who is going to do the work?" "Well," he answered, "I will do the work." To this I replied, "It is my opinion you will not succeed; but, all the same, put me down for it, first and last."

To-day I rejoice that my prophecy was so far from being correct; and what shall be said of the man—"I will do the work"—for no man in the 19th century in an individual pursuit has accomplished so much for his profession as he has. His fellows in the United States have been protected from annoyance and persecution, and as for the money saved, a low estimate would be *ten millions*.

Do not misinterpret the writer, for he is a believer in patents. Patents are like all good things in this world, if abused they become an evil in ratio to their good.

As the DIGEST made its monthly visits I scanned its pages. One day my eye caught "New York Letter," and I enjoyed it, as I have all of them. One thing in them is so plainly "New York," and between the lines one may read the peculiar egotism that may be found in connection with everything that pertains to New York.

One evening while enjoying a cigar and looking over the DIGEST I discovered "Philadelphia Letter." It started out with an unusual amount of spice for a Quaker town. Did the pepper make the writer sneeze so that he crawled back into his Quaker shell, concluding to have nothing further to do with the loud city of Chicago?

Now, dear DIGEST, if you see fit to publish this rambling talk, I may have courage to send you a letter some other day. QUAKER.

NEW YORK LETTER.

NEW YORK, April 15, 1897.

To the Editor of the Digest,

MR. EDITOR:—We send the following notice from the *New York Tribune* of April 9: "William Wilshire Riley, 81 years old, died at his home in Cromwell, Conn., yesterday from injuries caused by a fall some weeks ago. He was the inventor of many successful articles. The rubber plate for false teeth, a single-track elevated railroad, a life-boat with a balloon attachment, and a tongueless buckle are among his inventions."

The April election of the First District Society selected Dr. Starr for president, Dr. Dean for vice-president, and Dr. Nash for recording secretary. Dr. Nash has held his office thirteen years; he is very popular. We were much impressed with the makeup of the body as it appeared at election this year, so largely composed of a younger class of men, and prospectively a good lot of them, scarcely any of the older members being present. It looks as though they were willing that young blood should infuse the body. We don't see anything bad about such a conclusion. The young must show what they are able to do. New ideas are needed.

Dr. Davenport's article advocating the frequent restoration with amalgam of teeth deformed by decay, rather than the more prevalent use of crowns, is being scored by many practitioners. Just think of the forward movement of this "wicked amalgam." It is coming to this, that if it is not used more it will be a violation of the real interests of the public. It cannot be charged that Dr. Davenport is prejudiced, for he is a level-headed up-to-date practitioner, and well-known for many years as the able editor of the New York Odontological Society. There is a decided feeling upon this matter of restoring the forms of teeth with amalgam and screws. There is an almost unlimited field of usefulness before us, and an opportunity for the display of much inventive genius. We think there could be a form of platina screw, ready for use, produced by the trade, which would expedite the operation of making the restorations; also matrices, to be kept on until the amalgam hardens, that would be of assistance in more perfectly and readily giving the forms. It is marvelous how quickly a missing molar or bicuspid can be supplied on merely the remaining roots, although they are much decayed, often below the gum line. We will call attention to something here that has greatly hindered building crowns of amalgam upon roots, where much of the amalgam rested upon the soft tissues adjoining these roots, viz., the fear that the sanitary condition would be seriously disturbed. This prejudice is not borne out by results. We have improved our opportunity of investigating the extreme use of amalgam by our much respected, careful and ingenious colaborer, Dr. Clowes, of New York. No man has more boldly trespassed on the soft tissues with amalgam than he, and our testimony is from actual observation—we have been agreeably surprised by the results. Really, we do not think that there is any department of

practice so open and so capable of producing useful results as this field. We believe that what we have said will create a thoughtful desire on the part of some to show a decided development in this direction. It seems a pity that progressive men should spend their energies and use their influence in decrying an article that has so certainly forged its way to the front against such a tirade of prejudice. We have no hesitation in predicting that amalgam, associated with the porcelain cements, will stand bravely in the front of all other materials for the preservation and restoration of the human teeth. Some will say that this is of course meant to apply to teeth back of the anterior. Yes, in the main; but we are finding that not infrequently very badly decayed anterior teeth can be artistically restored by these materials, both in form and otherwise. It will be found that while many operations in the anterior teeth would seem favorable for using these materials in the minds of some, they may shrink back and say that gold can be associated only where the dividing line can be made, and without the use of the porcelain cements there would be sometimes objections; but the prime objections are removed, because the dark line (by oxidization) is prevented; it does not occur in connection with the cements. While we have made many operations with gold and amalgam without the cements, always obscuring the dividing line, we can now bring this dividing line more into sight and not destroy the esthetic taste by having a black line. Understand us, we are speaking conservatively of this mode of practice—as we define the word at the present day understanding. We speak earnestly of this subject because it is taking hold of the New York practice more than many outsiders are aware.

Hartford, Conn., has after many years a city society. This is as it should be; no city should be without a social gathering of practitioners. Strength is generated by a fraternal coming together. This spirit was what moved large bodies of dentists thirty-five years ago and the result was an activity never before known. For many years it bore much fruit. We do not wish to seem to drop a wet blanket upon the present day movements, but we do not see anything like the spirit we saw manifested during the sixties. We are in another age. It is "Leadership" too much now.

Cordially, NEW YORK.

The Dental Digest.

PUBLISHED THE

TWENTY-EIGHTH DAY OF EVERY MONTH.

Editorial.

ILLINOIS STATE DENTAL SOCIETY.

The thirty-third annual meeting of this society will be held at Peoria, May 11-14, 1897. An excellent program has been prepared and can be found on page 261 of this issue. The railroads have granted a rate of one fare and a third, and the hotels at Peoria have made special rates. The executive committee hope to largely increase the membership at this meeting, and to this end we would urge that every dentist in the state attend this, his state organization.

COMPENSATION FOR ORIGINAL INVESTIGATION.

The question of engaging competent men in the profession to do original work, and of paying them for their time so that they can give the whole of it to this work, is again being agitated, by a letter from Dr. C. Edmund Kells, Jr., in the *Cosmos*, and also by the editor of that journal.

We have been urging for years that this is what the profession should do. At the meeting of the American Dental Association in 1885, held at Minneapolis, we recommended that the association should undertake this work, but it has never taken any tangible form as yet. It is true the American Dental Association expends some money on section work, but thus far this work has not taken very definite shape. To engage such men as Black, Williams and others who are competent is the thing for the profession to do. We have also urged, both by circular and in speeches, that the raising of funds for this work and the control of same should be the work of the Protective Association.

The testing of amalgam is only one little part of what should be done. It is true the question of amalgam is a serious one, and we are disposed to think that amalgam as furnished to the profession and as manipulated by it has been a curse rather than a benefit to humanity. It has certainly been a great detriment to the profession, not one out of twenty-five of the different preparations manufactured being fit for use. And unless one is fully equipped with appliances for testing amalgam, and is familiar with this kind of

work, he cannot recognize the difference between a good preparation and a poor one, even if he could spend the time and trouble to test all the amalgam he uses.

From our correspondent in New York we are informed that the amalgam question is one of the exciting topics there at this time. We always look for good to come from such agitation.

AMERICAN DENTAL ASSOCIATION.

We again call attention to the meeting of the American Dental Association at Old Point Comfort, Va., the first Tuesday in August.

Railroad arrangements are almost completed and we feel confident we shall secure a rate of a fare and a third, on the certificate plan, from all the trunk lines. The Southern Dental Association will hold its meeting at the same time and place, also the College Faculties' Association and the National Board of Dental Examiners. One important question that will come up before this meeting will be the consolidation of the two associations into one national organization.

The literary work and work of the sections should also be made prominent and effective this year. Correspond with the chairman or secretary of the different sections and see what you can do to help make the reports valuable.

A program of the meeting, hotel rates, etc., will soon be sent every one whom we think will attend. Send us your name that you may secure one. Those not already members of one or the other of the associations, but who expect to attend, should get the credentials from their local society as delegates to the meeting. Each society is entitled to one delegate for every five members. Let us have a full attendance of representative men this year.

REPLY TO DRS. BLACK AND JOHNSON.

In the March issue of this journal we published the criticisms of Drs. Black and Johnson on our editorial in which we criticised Dr. Black's paper—"Recent Improvements in Filling Teeth."

In our criticism we took exception to the radical and universal method of cutting away the enamel from the approximal surface, both buccal and lingual, to and even beyond the free margin of the gum, where decay has attacked the approximal surface, and restoring same with cohesive gold. But we commended this admirable paper and urged careful study of the subject—the most important

in operative dentistry. At least it has seemed so to us, and during the last twenty-five years it has been our practice, as a rule, to restore and preserve the contour of the approximal surfaces. But we did not anticipate the further attack of caries beyond the surfaces of the gold to the extreme suggested by Dr. Black.

We took exception to this part of the essay, not so much because of the difference of opinion, as because we hoped by so doing to get a more general discussion and study of the subject, and an improvement in the methods of practice in better caring for the approximal surfaces. For no one can deny that much of the service rendered in this branch of practice by the profession has been a series of mistakes and failures, although requiring more skill and good judgment than anything we are called upon to do.

The first consideration in any part of dental practice is the securing of a perfect masticatory apparatus, and this holds true to the fullest extent in treating the approximal surfaces of the molars and bicuspids. The way to make these teeth most useful is to preserve or restore the contour so that the patient when chewing does so with comfort and effectiveness.

The one question that admits of difference of opinion is not whether the natural contour shall be preserved, but whether the entire proximal surface of tooth substance shall be cut away to the free margin of the gum, also the buccal and lingual walls, so that the margins of the filling shall be kept clean by the excursions of food in process of mastication, independent of the amount of decay already taken place. We have had the care of many mouths where the preparation and shaping of the cavity had not extended beyond the affected part, so that all parts were readily reached and filled, and these fillings have stood the test of time; but on the other hand, in some cases the decay has recurred or advanced beyond the perfect filling, thus making another operation necessary. We are therefore inclined to think that the error in such cases has been that the entire approximal surface was not protected by gold, thus saving the second operation.

The other question is the time necessary to perform these operations. If Drs. Black and Johnson have such improved methods that they can perform them so much quicker than others they should surely give us all the benefit of their superior skill and knowledge. They should give us the details and let us know wherein we waste

our time, and we hope to hear from them as to all the steps in a given operation, also the instruments used. At present we do not take off one minute from the average time we stated as required to make complete and perfect contour fillings of cohesive gold which occupy the entire approximal surface, and which perfectly preserve the marble-shaped surface, each coming in contact with the other in the proper position.

Notices.

A CORRECTION.

On p. 199 of the March DIGEST it states that the American Association will meet the second Tuesday in August. It should read the first Tuesday.

MICHIGAN DENTAL ASSOCIATION.

The annual meeting of this association will be held at Battle Creek, June 8-10, 1897. A cordial invitation is extended to the profession in this and other states to be present. H. C. RAYMOND, Sec'y, Detroit.

CHICAGO DENTAL SOCIETY.

At the annual meeting of this society, held April 6, 1897, the following officers were elected:—President, A. H. Peck; First Vice-President, D. M. Gallie; Second Vice-President, G. T. Carpenter; Recording Secretary, E. Mawhinney; Corresponding Secretary, George B. Perry; Treasurer, E. D. Swain; Member Board Directors, J. N. Crouse; Board of Censors, D. M. Cattell, A. W. McCandless, J. J. Whaley.

ILLINOIS STATE DENTAL SOCIETY—SPECIAL NOTICE.

Dentists of the state are cordially invited to attend the meeting and come prepared to join the society. Any reputable practitioner is eligible for membership and need not fear rejection if properly vouched for by two members of the society. It is the desire of the officers to create a membership of 500 within the next year or two. Will you help swell this number?

J. G. REID, Chairman Executive Committee.

LIST OF LATEST DENTAL PATENTS.

579,785. Samuel H. Barton, Prince's Bay, N. Y. Means for Raising or Lowering Dental Chair.

579,798. Harry E. Hawksworth, Philadelphia. Vulcanizer.

TRADE MARKS:

29,840. Herman C. G. and F. A. Luyties, St. Louis, Mo. Dentifrice.

29,841. Purity Dental Specialty Co., Sullivan, Ind. Dentifrices and Preparations for Teeth and Gums.

CHICAGO COLLEGE OF DENTAL SURGERY.

The fifteenth annual commencement of this college was held at Central Music Hall, April 1, 1897, at 2 p. m. The program was:—Music; Invocation, Wm. M. Lawrence, D.D.; Music; Address, John J. Halsey, M. A., Acting President of the University; Music; Annual Report, A. W. Harlan, A. M.,

M.D., D.D.S., Secretary; Music; Conferring of Degrees, Truman W. Brophy, M.D., D.D.S., L.L.D., President of the College; Music; Class Valedictory, Enoch Arden Reyber, D.D.S.; Music; Doctorate Address, L. L. Skelton, A.M., M.D.; Music.

TRI-UNION MEETING.

A tri-union meeting of the Maryland State Dental Association, the Washington City Dental Society, and the Virginia State Dental Association will be held at Old Point Comfort, Va., on May 6-8, 1897. A special feature of this meeting will be the presence of a large number of clinicians, who will practically demonstrate the latest theories of advanced dentistry. A cordial invitation is extended to all progressive dentists.

F. F. DREW, Sec'y Md. State Association,
701 North Howard St., Baltimore.

TIME TABLE OF TRAINS TO PEORIA FOR ILLINOIS STATE DENTAL SOCIETY MEETING.

The service of the Chicago, Rock Island and Pacific Railway between Chicago and Peoria is unsurpassed. The morning train leaves Chicago at 9:00 a. m., and reaches Peoria at 3:00 p. m. Those who desire to make the trip at night can leave Chicago at 10:10 p. m., arriving at Peoria 7:15 a. m. For those engaged in business in the city, and who cannot leave until at or near closing hours, the most suitable train is the one leaving Chicago at 4:15 p. m. and reaching Peoria at 9:05 p. m. All these three trains give excellent service, and the return accommodations from Peoria are equally as good—one train leaving at 11:30 p. m., arriving at Chicago 7:10 a. m.; one leaving 6:15 a. m., reaching Chicago 11:00 a. m., and another at 1:55 p. m., reaching Chicago at 7:20 p. m. All trains start from and arrive at the main depot, Van Buren and Clark Sts., Chicago. For further information address Geo. F. Lee, City Passenger Agent, 91 Adams St., Chicago.

PROGRAM OF ILLINOIS STATE DENTAL SOCIETY.

1. Annual address by the President, Dr. C. R. Taylor, Streator, Ill.
2. Report of the Committee on Dental Science and Literature, by Dr. A. W. Harlan, Chicago.
3. Report of the Committee on Dental Art and Invention, by Dr. J. E. Keefe, Chicago.
4. Pyorrhea Alveolaris, by Dr. J. W. Wassall, Chicago. Discussion opened by Dr. A. W. Harlan.
5. Classification of Cavities and Rules Governing their Preparation, by Dr. W. E. Harper, Chicago. Discussion by Dr. C. B Rohland, Alton, Ill.
6. Opinions of the Illinois Dentists regarding Dental Societies, by Dr. E. H. Allen, Freeport. Discussion opened by Dr. Geo. H. Cushing, Chicago.
7. How Shall We Best Insert a Gold Filling? by Dr. Arthur G. Smith, Peoria, Ill. Discussion opened by Dr. C. N. Johnson, Chicago.
8. Diffusibility of Coagulants in Dentin, by Dr. E. Lawley York, Chicago. Discussion opened by Dr. J. E. Hinkins, Chicago.
9. Be a—Man, by Dr. A. H. Peck, Chicago. Discussion opened by Dr. A. H. Fuller, St. Louis.
10. Static Anchorages for the Regulation of Teeth, by Dr. C. S. Case, Chicago. Discussion opened by Dr. Garrett Newkirk, Chicago.
11. The Relations of the Teeth to the Lips and Face, by Dr. A. O. Hunt, Chicago. Discussion opened by Dr. G. A. Thomas, Chicago.
12. Practical Things in Dental Practice, by Dr. J. G. Templeton, Pittsburg. Discussion opened by Dr. Edgar D. Swain, Chicago.
13. Anchoring Large Contour Fllings in Incisors, by Dr. L. W. Skidmore, Moline, Ill. Discussion opened by Dr. R. M. Pearce, Rock Island.

14. Report of Supervisor of Clinics, by Dr. T. W. Pritchett, White Hall.

15. Questions submitted by American Dental Association for discussion by local societies:

(a) To what extent and when are we justified in using cataphoresis? Is there danger of injuring the dental pulp or other tissues by its use?

(b) What are the best methods of bleaching teeth?

PROGRAM OF CLINICS.—Dr. E. K. Blair, Waverly. Gold filling in distal cavity of a cuspid.

Dr. G. A. Thomas, Chicago. Fusing porcelain with the electric furnace.

Dr. Gustavus North, Springville, Iowa. Will demonstrate a method of constructing partial lower vulcanite dentures.

Dr. G. B. Dillon, Sterling, Ill. Gold filling in a bicuspid, using matrix.

Dr. R. N. Laurence, Lincoln, Ill. Will treat cases of pyorrhea alveolaris by Dr. Younger's method.

Dr. C. C. Corbett, Edwardsville, Ill. Gold filling in proximal cavity.

Dr. J. W. Cormany, Mt. Carroll. Fillings with Dr. Black's modified alloy.

Dr. E. T. Brigham, Watseka, Ill. A method of using vulcanite teeth—bicuspids and molars—in bridge work.

Dr. R. M. Pearce, Rock Island, Ill. Gold filling with hand mallet.

Dr. C. B. Sawyer, Jacksonville. Fillings with Dr. Black's modified alloy.

Dr. F. Primrose, Springfield. A simple method of fitting a Logan crown.

Dr. C. H. West, Farina, Ill. Alloy filling—distal cavity in a bicuspid or molar—using the Booth matrix clamp.

Dr. J. W. Collins, Lincoln, Ill. A gold filling.

Dr. Thomas L. Gilmer, Chicago. Filling a superior bicuspid with gold—demonstrating scientific preparation of cavity, and restoration of contour.

Dr. B. D. Wikoff, Chicago. Making crown—porcelain faced bicuspid.

Dr. F. B. Noyes, Chicago. Microscopic examination of amalgam fillings.

Dr. Nels Nelson, Chicago. Making bicuspid crown, using English tube tooth; also exhibit of crown and bridge specialties.

Dr. W. V. B. Ames, Chicago. Demonstration of the underlying principles of cataphoresis.

Dr. P. J. Kester, Chicago. Instrumentation of amalgams.

Dr. C. N. Johnson, Chicago. Prepared cavities in natural teeth.

Dr. C. P. Pruyn, Chicago. Some novel methods of applying the rubber-dam, and wedging.

Dr. Don M. Gallie, Chicago. Building down central incisor corner with platinum and gold.

Dr. J. O. Ely, Chicago. Practical demonstration of cataphoresis.

Dr. W. H. Taggart, Chicago. New method of applying the rubber-dam to difficult buccal and labial cavities—also something in porcelain work.

Dr. S. W. Lakin, Eureka, Ill. Restoration of one-quarter to one-third occlusal edge central incisor, with screw and Watts' crystal gold.

Dr. J. H. Woolley, Chicago. Proper methods of opening pulp-chambers and root-canals.

Dr. I. A. Freeman, Chicago. Filling distal cavity left superior cuspid.

AMERICAN DENTAL ASSOCIATION.

The American Dental Association will hold its next meeting at Old Point Comfort, Va., Tuesday, August 3, 1897. This will probably be the most important meeting of the American Dental Association held in years, as it is expected that the entire question of reorganization will be presented for settlement. It is therefore earnestly desired that each organization in affiliation with the American will make a responsive effort to have a full delegation present at Old Point Comfort, and have this body instructed in regard to the position held by your society in relation to this question.

It is further suggested that each society should devote at least one evening to the discussion of the question: Whether a change in the relations of the

two so-called national bodies, the American Dental Association and the Southern Dental Association, be desirable? In this way thought may be crystallized, and each delegate be prepared to meet the subject with the intelligence its importance demands.

Each state and local society which has adopted substantially the same Code of Ethics as that governing the conduct of members of the American Dental Association is entitled to one representative for every five members and fractional part thereof. Blank certificates for delegates may be had on application to the Corresponding Secretary.

By order of the President, Dr. James Truman.

EMMA EAMES CHASE, 3334 Washington Ave., St. Louis, Mo.
Corresponding Secretary American Dental Association.

News Summary.

BLOOD POISONING AFTER TOOTH EXTRACTION.—Dr. Port, of Munich, remarks that, "when we consider the large quantity of microorganisms which flourish in the mouth, it is extraordinary that dental extractions are not more frequently a source of infection." Dr. Miller's book cites only sixty cases, of which about half the number terminated fatally, while the other half recovered sooner or later. Death generally occurred from septicemia, pyemia or meningitis He gives a recent case of a young and vigorous man whose lower molar was extracted by means of the key. He developed fever and died in four days. The autopsy revealed a large abscess in the neck, the pleural cavities held a large quantity of fetid brown pus, while the pericardium also contained pus. The abscess disclosed streptococci and diplococci, and the latter resembled the salivary septicemic microbe described by Miller. —*Brit. Jour. Dent. Sc.*

CONTOURING A NOSE WITH CELLULOID.—At the Liverpool Medical Institution, Mr. Thelwall Thomas exhibited a patient, 15 years of age, whose nasal bones had disappeared in childhood from congenital syphilis, leaving the flat deformed appearance known as "saddle nose." Mr. Thomas modeled a piece of celluloid into the form of nasal bones, strengthened by a keel-shaped piece on the inner surface. This keel fitted between the nasal processes of the superior maxillæ and the lateral portions rested on the processes. The operation consisted in making an incision on the left side of the nose, inserting the celluloid subcutaneously into position and closing the incision by means of horsehair sutures. The operation was performed seven months ago and appeared to cause no irritation, while the personal appearance of the patient was remarkably improved. Mr. Thomas claims that this proceeding has many advantages over the many osteo-periosteal flap methods, all of which leave marked cicatrices.—*Brit. Jour. Dent. Sc.*

PROTECTION OF IRON FROM RUST.—It is stated by Deninger, that by applying a solution of a soluble ferrocyanid to the bright surface of iron a homogeneous and impermeable pellicle of ferrocyanid of iron is formed, which protects the surface from oxidation and so prevents the formation of rust. The solution of ferrocyanid is mixed with a linseed oil varnish containing a

small amount of benzol or of turpentine in such manner as to form a homogeneous emulsion. The iron to which this mixture is applied needs no preparation beyond removing any very thick patches of rust which might resist the action of the ferrocyanid.—*Pharmaceutical Journal.*

A FERTILE CAUSE OF DEFECTIVE TEETH.—By Dr. Wm. H. Richards, President of Southern Dental Association, Knoxville, Tenn. Dentists and physicians, in my judgment, do not recommend or prescribe as often as they should the use of suitable preparations for the care of children's teeth. If a proper and agreeable preparation be kept constantly in the nursery the little people will soon take a pleasure in its use, merely for its pleasant after-effects. Thus, through the apparent *play* with the detergent they are paving the way to sound teeth and healthy gums, besides keeping the secretions of the oral cavity free from unhealthy contamination before entering the body.

I have been trying for a long time various preparations of the kind, with a view to settling upon something which I could recommend to my patients without inviting reflections upon my judgment. With this end in view I critically examined the Euthymol Tooth Paste manufactured by Parke, Davis & Co., and I feel safe in saying that I can direct the use of this preparation without expecting anything but good results.

Obituary.

DR. FRANK ABBOTT.

"Dr. Frank Abbott died suddenly late last night at his home, 22 West Fortieth street. He was born in Maine about sixty-one years ago. He gave his life to the study of dentistry, and when he came to New York several years ago rapidly built up an extensive practice. For a number of years previous to his death he was dean of the New York College of Dentistry. A widow and a son, Dr. Frank Abbott, Jr., survive him."—*New York Tribune.*

The death of Dr. Abbott will be a surprise to many, but it was rumored some months ago that he had an aneurism which was threatening a sudden termination of his life. He was in his office all day yesterday, went out in the evening and returned about 11 o'clock, soon after went into a coma and passed away. He will be buried in Johnstown, N. Y.

Dr. Abbott was one of the original number that joined the fraternal coterie of the Atkinson movement. He has been a busy and very ambitious man. It seems not a little strange that he should so soon follow his fellow worker, Prof. Heitzman. Dr. Abbott leaves much behind in the way of work and success. He had brought together an unusually large practice and was well off in this world's goods. Probably no dentist had more acquaintance with the younger part of the profession, and his loss will be mourned by them as well as by the older practitioners. His face will be missed at our dental meetings, and we are reminded that a goodly number of the old familiar faces are gathering on the other shore.

Be ye also ready, for in such an hour as ye think not your summons come.

New York, April 21, 1897. G. ALDEN MILLS.

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Our Hypodermatic Tablet No. 81, "Local Anæsthetic (Dental)," is made, as stated above, after the formula of Dr. Hoff, and we beg to quote from his paper upon the subject, published in the *Ohio Dental Journal*, as follows.

"The combination I am now using as a local obtundent yields good results. I use sterilized water to make the solution, and, to prevent possible decomposition, make daily or as needed for use. The formula I use is as follows:

℞ Cocaine.....gr. 1-2
Sulphate of Morphine.....gr. 1-8
Sulphate of Atropine.....gr. 1-200
Sterilized water.....gtts. xxx
Mix and inject hypoder. gtts. v to xv.

"For convenience I have had the Cocaine, Morphine and Atropine made into soluble tablets by Parke, Davis & Co., of Detroit, and in this way solutions of any strength desired may be quickly and accurately made with little or no inconvenience. As a solvent I use distilled water containing from 8 to 10 per cent. Euthymol to keep it sterile. If desired to make a 2-per-cent. solution all that is necessary is to dissolve one tablet in 25 minims of water; a 1-per-cent. solution can be made by dissolving one tablet in twice this quantity of water, or 50 minims. A 4-per-cent. solution can be made either by reducing the water one-half or adding another tablet to the 25 minims, etc."

IN TUBES OF 25, 45 CENTS PER TUBE; OR FOUR TUBES (100 TABLETS), $1.65; OR, IN BOTTLES OF 100 TABLETS, $1.55 PER BOTTLE; BUT THESE TABLETS PARTICULARLY, BEING MADE VERY FRIABLE IN ORDER TO BE QUICKLY SOLUBLE, ARE BEST KEPT IN TUBES OF 25.

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